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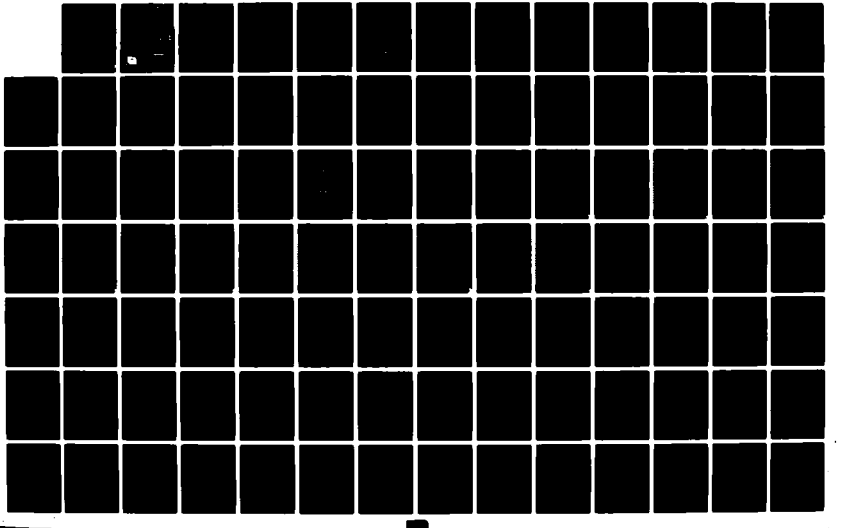

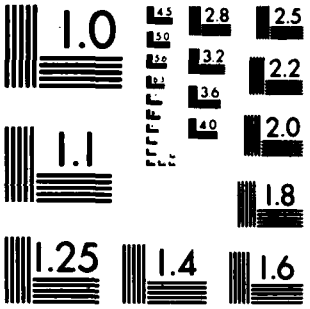

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A METHOD FOR CALCULATING INDUSTRIAL MOBILIZATION REQUIREMENTS WHICH INCORPORATES PRODUCTION PROCESS TIMES

VOLUME II
APPENDICES

Paul McCoy

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October 1982

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REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A123 871 / 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) A Method for Calculating Industrial Mobilization Requirements which Incorporates Production Process Times, Volume II -- Appendices	5. TYPE OF REPORT & PERIOD COVERED Final
	6. PERFORMING ORG. REPORT NUMBER IDA Paper P-1632, Vol II
7. AUTHOR(s) Paul McCoy	8. CONTRACT OR GRANT NUMBER(s) MDA 903 79 C 0202
9. PERFORMING ORGANIZATION NAME AND ADDRESS Institute for Defense Analyses 1801 N. Beauregard Street Alexandria, VA 22311	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS T-190
11. CONTROLLING OFFICE NAME AND ADDRESS Office of the Under Secretary of Defense for Research and Engineering - Acquisition Policy The Pentagon, Washington, DC 20301	12. REPORT DATE October 1982 / 13. NUMBER OF PAGES 141
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office) Defense Advanced Research Projects Agency 1400 Wilson Boulevard Arlington, VA 22209	15. SECURITY CLASS. (of this report) UNCLASSIFIED / 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE N/A
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.	
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)	
18. SUPPLEMENTARY NOTES	
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Industrial Base, Industrial Preparedness, IPP, Economic Models, Input-Output, Mobilization, Surge, Defense Spending	
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This paper presents a new economic model for assessing the industrial requirements generated by increased production for defense during a mobilization or due to a surge in requirements during peacetime. The model's procedure combines an input-output analysis of the direct and indirect requirements associated with defense production with information on processing times in each industry. In this way, one can determine not only the magnitude of production surges but also the time of peak activity in each industrial sector. (continued)	

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Item 20 (continued)

The model is used to simulate increases of 50 to 200 percent in the level of overall defense spending. Two sorts of bottlenecks are identified--the first involving industries where peak requirements exceed capacity and the second, where cumulated processing times exceed the preparation period envisioned in the scenario.

IDA PAPER P-1632

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VOLUME II

APPENDICES

Paul McCoy

October 1982

INSTITUTE FOR DEFENSE ANALYSES
PROGRAM ANALYSIS DIVISION
1801 N. Beauregard Street, Alexandria, Virginia 22311

Contract MDA 903 79 C 0202
Task T-190

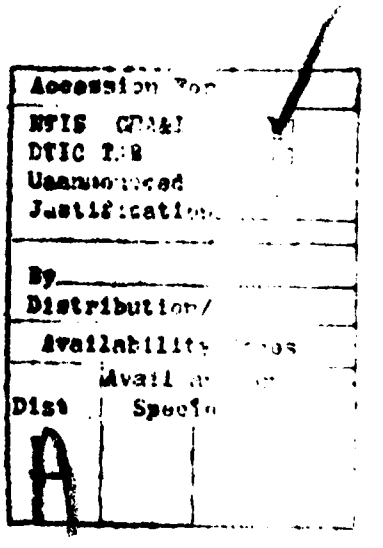
FOREWORD

The analytic model presented in this paper was created by Dr. Paul McCoy. When Dr. McCoy left employment with IDA, I assumed responsibility for maintaining the IDA study effort in industrial mobilization. Miss Eileen Doherty (PAD editor) and I have edited this paper for publication.

The substance of the paper is unchanged from Dr. McCoy's preliminary draft; however, certain material was excluded and the appendices transferred to a second volume for easier handling by the reader.

R. William Thomas

Dr. R. William Thomas



PREFACE

This paper was prepared by the Institute for Defense Analyses (IDA) for the Office of the Under Secretary of Defense Research and Engineering/Acquisition Policy (OUSDRE/AP) under Contract MDA 903 79 C 0202, Task Order No. T-190, dated April 1981.

The purpose of the study was to present an economic model for assessing the industrial requirements generated by increased production for defense during a mobilization or due to a surge in requirements during peacetime. The IMPMOD model's procedure combines an input-output analyses of the direct and indirect requirements associated with defense production with information on processing times in each industry. By so doing, one can determine the magnitude of production surges and the timing of peak activity in each industrial sector. The model simulates increases of 50 to 200 percent in the level of overall defense spending. Two sorts of bottlenecks are identified--the first involving industries where peak requirements exceed capacity, and the second, where cumulative processing times exceed the preparation period envisioned in the scenario.

This publication is issued in fulfillment of the contract.

ACKNOWLEDGMENTS

I wish to express my appreciation to Mr. John DuBreuil of the Office of the Director for Materiel Acquisition Policy, OUSDRE, who initiated the study, provided overall direction, and gave advice and assistance on a continual basis.

Many other people assisted by providing data and suggesting improvements. Particularly helpful have been Dr. James Bell, Dr. David Blond, Dr. Herschel Kanter, Lt. Col. Thomas Moore, Dr. Michael O'Brien, and Dr. R. William Thomas.

Paul McCoy

CONTENTS

VOLUME I

FOREWORD iii

PREFACE v

ACKNOWLEDGMENTS vii

EXECUTIVE SUMMARY S-1

I. INTRODUCTION 1

A. Background 1

B. Current Models for Mobilization Planning 2

C. Study Approach 3

II. METHODOLOGY. 7

A. General Model Structure. 7

B. An Internally Dynamic Input-Output Model 9

1. A Static Input-Output Model. 12

2. A Time-Phased Model Viewed as an Enlarged Static Model 14

3. A Time-Phased Model Viewed as a Network Model. 16

C. Possible Extensions. 18

III. DATA 19

A. Commodities and Associated Input-Output Table. 19

B. Production Processing Time 30

C. Defense Requirements 32

D. Non-Defense Consumption. 32

E. Production Capacity. 35

IV. MODEL RESULTS. 37

A. Results of Displaying Model Structure. 37

1. Critical Path Networks 37

2. Individual Commodity Expansions 46
B. Requirements for Industrial Mobilization. . . . 46
1. Assumptions 46
2. Time-Phased Requirements and Production Capacity. 52
V. CONCLUSIONS 61
A. Major Assumptions and Limitations 61
B. Mobilization Capability of the U.S. Economy 64
C. Uses of IMPMOD. 69
REFERENCES 70

VOLUME II

APPENDICES

A INDUSTRIAL MOBILIZATION PLANNING MODEL (IMPMOD) GENERAL DESCRIPTION
B CRITICAL PATH NETWORKS FOR MAJOR DEFENSE COMMODITIES
C ALTERNATIVE TIME-PHASING FOR SELECTED INDUSTRIAL AND DEFENSE COMMODITIES

FIGURES

VOLUME I

S-1 Defense Expansion Goals S-1
S-2 Feasible Defense Expansions S-9
1 Defense Expansion Goals 4
2 Time-Phased Requirements With and Without Production Delays 11
3 Associated Critical Path Network for Commodity i for Final Demand Delivered at Time T. 17
4 Critical Path Network for Aircraft Production . . . 39
5 Critical Path Network for Ship Production 41
6 Critical Path Network for Tank Production 43

7 Time-Phased Indirect Requirements for the Production of Aircraft. 47

8 Time-Phased Indirect Requirements for the Production of Ships 48

9 Time-Phased Indirect Requirements for the Production of Tanks 49

10 Total Requirements for Guided Missiles Based on a Defense Surge of $360 Billion With Delivery Spread Over 156 Weeks 53

11 Total Requirements for Tanks Based on a Defense Surge of $360 Billion With Delivery Spread Over 156 Weeks 54

12 Total Requirements for Nonferrous Forgings Based on a Defense Surge of $360 Billion With Delivery Spread Over 156 Weeks 55

13 Total Requirements for Primary Zinc Based on a Defense Surge of $360 Billion With Delivery Spread Over 156 Weeks. 56

14 Feasible Defense Expansions 68

VOLUME II

A-1 Industrial Mobilization Planning Model Program Linkage A-3

A-2 Program IMPMOD1 . . . . . A-11

A-3 Program IMPMOD2 . . . . . A-14

A-4 Program IMPMOD3 . . . . . A-16

A-5 Program IMPMOD4 . . . . . A-18

A-6 Program IMPMOD5 . . . . . A-19

B-1 Critical Path Network for Aircraft Production . . . B-3

B-2 Critical Path Network for Ship Production B-5

B-3 Critical Path Network for Tank Production B-7

B-4 Critical Path Network for Guided Missile. B-9

B-5 Critical Path Network for Small Arms Production. B-11

B-6 Critical Path Network for Ammunition Production. B-13

B-7 Critical Path Network for the Production of Small Arms Ammunition B-15

B-8 Critical Path Network for the Production of Other Ordnance. B-17

TABLES

VOLUME I

S-1 Major Assumptions S-4

S-2 The Ten Commodities Most Constrained by Existing Production Capacity (Based on a One-Year Delivery Period). S-6

S-3 The Ten Commodities With the Earliest Surge in Requirements (Based on a One-Year Delivery Period) S-7

1 IMPMOD Commodities and Estimated Requirements in 1981 (Millions of 1981 Dollars). 21

2 Estimated Commodity Process Times 31

3 Defense Purchase Pattern. 33

4 Additional Outlays Associated With Surge in Procurement 50

5 Mobilization Constraints for Selected Commodities 59

6 Major Assumptions 62

7 The Ten Commodities Most Constrained by Existing Production Capacity (Based on a One-Year Delivery Period). 65

8 The Ten Commodities With the Earliest Surge in Requirements (Based on a One-Year Delivery Period) 66

VOLUME II

A-1 Major Programs in IMPMOD. A-2

A-2 Primary Disk Files in IMPMOD. A-2

A-3 Industry Classification of the 1972 Input-Output Tables. A-6

A-4 Commodities With no Non-Zero Commodity--Commodity Coefficients. A-10

C-1 Seleected Industrial and Defense-Oriented Commodities C-2

APPENDIX A

INDUSTRIAL MOBILIZATION PLANNING MODEL (IMPMOD)
GENERAL DESCRIPTION

INDUSTRIAL MOBILIZATION PLANNING MODEL (IMPMOD)
GENERAL DESCRIPTION

A. OVERVIEW

The Industrial Mobilization Planning Model (IMPMOD) is a computer model designed to estimate industrial production requirements needed to support a major military force expansion. Defense end item requirements include not only the demands of major weapon systems but also the host of other items required by DoD in a mobilization, as well as essential civilian requirements. Sub-tier requirements are estimated using an input-output model. Requirements for all commodities are time-phased so as to determine where capacity expansion might be needed first.

The model uses the defense expenditure patterns developed by Dr. David Blond of PA&E which translate defense expenditures into purchases of industrial commodities as well as the civilian purchase patterns developed by the Department of Commerce. Commerce's 496 sector input-output model is used to calculate total direct and indirect requirements which are also time-phased to take into account each commodity's processing time. The result is a plot of time-phased requirements for each four-digit SIC code commodity matched against estimated capacity.

The intent of the model is to identify those industrial commodities whose production capacity would most constrain a major force expansion, to identify which commodities would be required first, and to assess the impact of reductions in production lead times.

The model is written in FORTRAN and is currently being run on a CDC 6400 computer with a Cal Comp plotter. The model consists of the five separate programs listed in Table A-1 which create and, in turn, use the four disk files listed in Table A-2. Figure A-1 depicts the general data flow between the programs. The model was segmented into five programs due to the large data files, long run times, and the limited core memory of our computer. Each program will be described in more detail below.

Table A-1. MAJOR PROGRAMS IN IMPMOD

Program	Average Run Time	Core Memory Requirements
1. IMPMOD1	15 minutes	21,500 words
2. IMPMOD2	40 minutes	28,800 words
3. IMPMOD3	20 minutes	30,100 words
4. IMPMOD4	4 hours	28,100 words
5. IMPMOD5	20 minutes	34,800 words

Table A-2. PRIMARY DISK FILES IN IMPMOD

Disk File	Number of Records	Total Number of Words
1. TAPE1	520	30,000
2. TAPE2	550	30,848
3. TAPE3	1,200	91,200
4. TAPE4	550	47,168

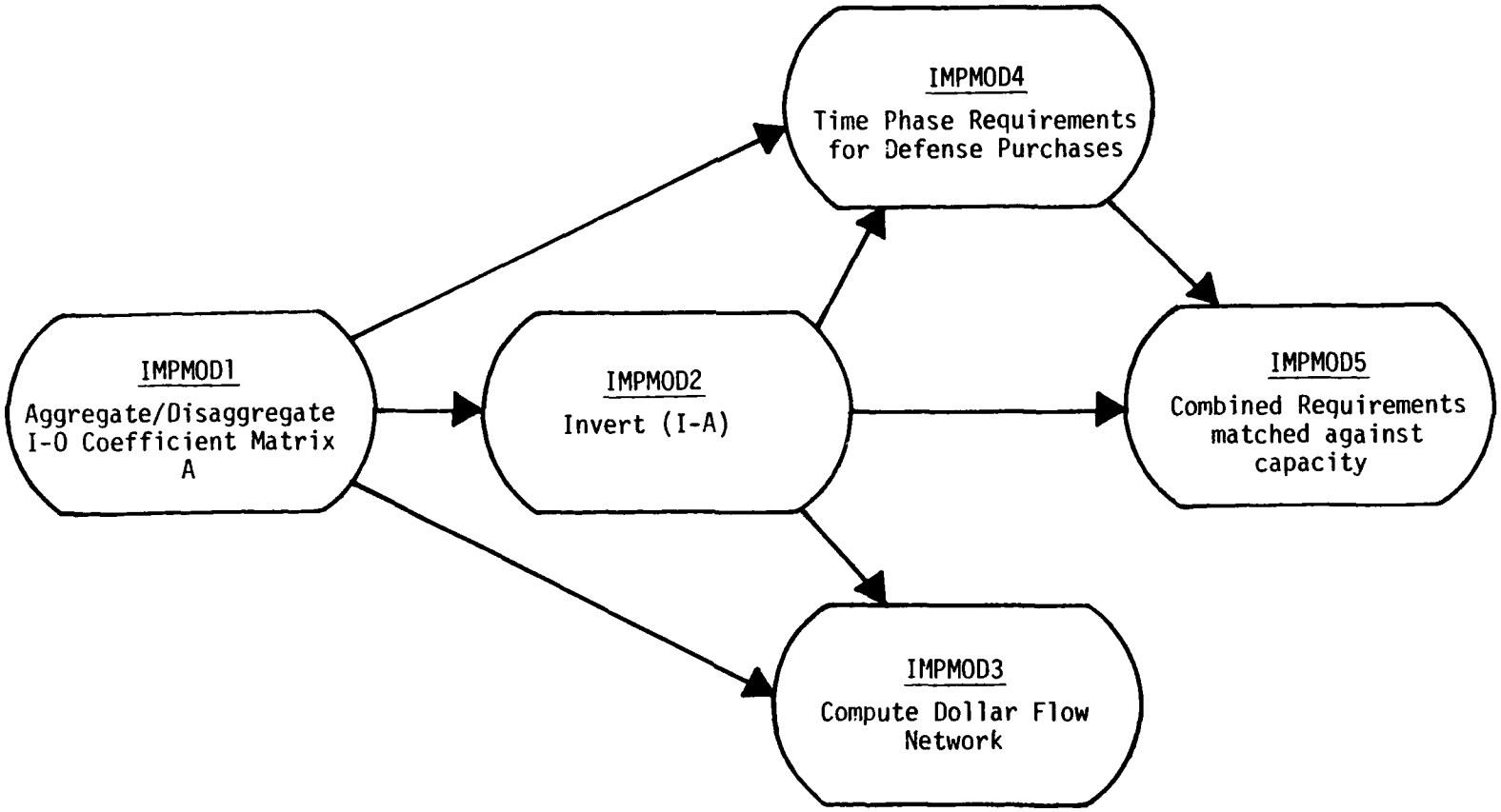


Figure A-1. INDUSTRIAL MOBILIZATION PLANNING MODEL PROGRAM LINKAGE

B. PROGRAM IMPMOD1--AGGREGATE/DISAGGREGATE THE COEFFICIENT MATRIX

The program IMPMOD1 reads the commodity-to-commodity input-output table off a data tape supplied by the Department of Commerce. Table A-3 is a listing of the commodities in the table less those listed in Table A-4. The table contains 485 commodities with 56,046 nonzero entries. The first task performed by IMPMOD1 is to convert the row and column pointers from ID numbers, which are decimal numbers, to integers so that the input-output matrix can be easily manipulated by the programs that follow. The second task is to aggregate and/or disaggregate the input-output matrix. Many commodities, like consumer-oriented products, are of less significance in supporting a force expansion. For these commodities the program may be used to aggregate from the four-digit SIC code level to the two-digit level. For other commodities vital to a defense expansion, the four-digit level may be too aggregated. In these cases, one or more commodities may be disaggregated into several more detailed commodities. As such, estimates of 1972 inter-commodity dollar flows must be input for each commodity that is more detailed than the four-digit level. The final task performed by IMPMOD1 is to create Disk File TAPE4 which contains the new input-output table in a form usable by the programs that follow.

Figure A-2 shows the inputs and outputs of IMPMOD1. Below is a description of the aggregation process. Let A be the input-output matrix before aggregation and A′ the matrix after aggregation. Suppose that it is desired to aggregate all commodities between i_1 and i_2 into commodity i:

$$A = \{a_{ij}\} = \begin{array}{c} \begin{array}{cc} i_1 & i_2 \end{array} \\ \left(\begin{array}{cc} & \\ & \\ & \end{array} \right) \begin{array}{l} \\ i_1 \\ i_2 \end{array} \end{array}$$

$$a'_{ij} = \sum_{\ell=i_1}^{i_2} a_{\ell j} \quad \text{for all commodities } j \text{ (new row), and}$$

$$a'_{ij} = \left(\sum_{\ell=i_1}^{i_2} a_{j\ell} * W_\ell \right) \Big/ \sum_{m=i_1}^{i_2} W_m \quad \text{for all commodities } j \text{ (new column),}$$

where W_m is the total shipments in 1972 of commodity m .

Table A-3. INDUSTRY CLASSIFICATION OF THE 1972 INPUT-OUTPUT TABLES[1]

Industry Classification of the 1972 Input-Output Tables[1]

The titles in bold face represent the groupings of industries used for the summary version of the 1972 tables.

Industry number and title	Related Census-SIC codes (1972 edition)
AGRICULTURE, FORESTRY, AND FISHERIES	
1 Livestock and livestock products	
1.0100 Dairy farm products	0241, pt. 0191, pt. 0259, pt. 0291
1.0200 Poultry and eggs	025 excl. 0254 and pt 0259), pt. 0191, pt. 0219, pt. 0291
1.0301 Meat animals	021 excl. pt. 0219), pt. 0191, pt. 0259, pt. 0291
1.0302 Miscellaneous livestock	027, pt. 0191 pt. 0219 pt. 0259, pt. 0291
2 Other agricultural products	
2.0100 Cotton	0131, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0201 Food grains	pt. 011, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0202 Feed grains	pt. 011, pt. 0139, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0203 Grass seeds	pt. 0139, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0300 Tobacco	0132, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0401 Fruits	pt. 017, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0402 Tree nuts	0173, pt. 0179, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0501 Vegetables	0134, 0161, pt. 0119, pt. 0139, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0502 Sugar crops	0133, pt. 0191, pt. 0219, pt. 0259, pt 0291
2.0503 Miscellaneous crops	pt. 0119, pt. 0179, pt. 0191, pt. 0219, pt 0259, pt. 0291
2.0600 Oil bearing crops	0116, pt. 0119, pt. 013, pt. 0173, pt. 0219, pt. 0259, pt. 0291
2.0701 Forest products	pt. 018, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0702 Greenhouse and nursery products	pt. 018, pt. 0191, pt. 0219, pt. 0259, pt. 0291
3 Forestry and fishery products	
3.0000 Forestry and fishery products	081-4, 091, 097
4 Agricultural, forestry, and fishery services	
4.0000 Agricultural, forestry, and fishery services	0254, 07 excl. 0741, 085, 092
MINING	
5 Iron and ferroalloy ores mining	
5.0000 Iron and ferroalloy ores mining	101, 106
6 Nonferrous metal ores mining	
6.0100 Copper ore mining	102
6.0200 Nonferrous metal ores mining, except copper	103-5, pt. 108, 109
7 Coal mining	
7.0000 Coal mining	1111, pt. 1112, 1211, pt. 1213
8 Crude petroleum and natural gas	
8.0000 Crude petroleum and natural gas	131, 132, pt. 138
9 Stone and clay mining and quarrying	
9.0000 Stone and clay mining and quarrying	141-5, pt. 148, 149
10 Chemical and fertilizer mineral mining	
10.0000 Chemical and fertilizer mineral mining	147
CONSTRUCTION	
11 New construction	
11.0101 New residential 1-unit structures, nonfarm	pt. 15, pt. 17
11.0102 New residential 2-4 unit structures, nonfarm	pt. 15, pt. 17
11.0103 New residential garden apartments	pt. 15-17
11.0104 New residential high-rise apartments	pt. 15-17
11.0105 New residential additions and alterations, nonfarm	pt. 15, pt. 17
11.0106 New hotels and motels	pt. 15-17
11.0107 New dormitories	pt. 15, pt. 17
11.0201 New industrial buildings	pt. 15-17
11.0202 New office buildings	pt. 15, pt. 17
11.0203 New warehouses	pt. 15, pt. 17
11.0204 New garages and service stations	pt. 15, pt. 17
11.0205 New stores and restaurants	pt. 15, pt. 17
11.0206 New religious buildings	pt. 15, pt. 17
11.0207 New educational buildings	pt. 15, pt. 17
11.0208 New hospital and institutional buildings	pt. 15, pt. 17
11.0209 New other nonfarm buildings	pt. 15, pt. 17
11.0301 New telephone and telegraph facilities	pt. 16, pt. 17
11.0302 New railroads	pt. 16, pt. 17
11.0303 New electric utility facilities	pt. 16, pt. 17
11.0304 New gas utility facilities	pt. 16, pt. 17
11.0305 New petroleum pipelines	pt. 16, pt. 17
11.0306 New water supply facilities	pt. 16, pt. 17
11.0307 New sewer system facilities	pt. 16, pt. 17
11.0308 New local transit facilities	pt. 16, pt. 17
11.0309 New highways and streets	pt. 16, pt. 17
11.0501 New farm housing units and additions and alterations	pt. [illegible]
11.0502 New farm service facilities	pt. 15, pt. 17
11.0503 New petroleum and natural gas well drilling	pt. 35
11.0504 New petroleum, natural gas, and solid mineral exploration	pt. 138, pt. 1111, pt. 1213, pt. 138, pt. 148
11.0505 New military facilities	pt. 15-17
11.0506 New conservation and development facilities	pt. 15-17
11.0507 Other new nonbuilding facilities	pt. 15-17
11.0508 New access structures for solid mineral development	pt. 138, pt. 1112, pt. 1213, pt. 148
12 Maintenance and repair construction	
12.0100 Maintenance and repair, residential	pt. 15, pt. 17
12.0201 Maintenance and repair of other nonfarm buildings	pt. 15, pt. 17
12.0202 Maintenance and repair of farm residential buildings	pt. 15, pt. 17
12.0203 Maintenance and repair of farm service facilities	pt. 15, pt. 17
12.0204 Maintenance and repair of telephone and telegraph facilities	pt. 16, pt. 17
12.0205 Maintenance and repair of railroads	pt. 16, pt. 17
12.0206 Maintenance and repair of electric utility facilities	pt. 16, pt. 17
12.0207 Maintenance and repair of gas utility facilities	pt. 16, pt. 17
12.0208 Maintenance and repair of petroleum pipelines	pt. 16, pt. 17
12.0209 Maintenance and repair of water supply facilities	pt. 16, pt. 17
12.0210 Maintenance and repair of sewer facilities	pt. 16, pt. 17
12.0211 Maintenance and repair of transit facilities	pt. 16, pt. 17
12.0212 Maintenance and repair of military facilities	pt. 15-17
12.0213 Maintenance and repair of conservation and development facilities	pt. 15-17
12.0214 Maintenance and repair of highways and streets	pt. 16, pt. 17
12.0215 Maintenance and repair of petroleum and natural gas wells	pt. 35
12.0216 Maintenance and repair of other nonbuilding facilities	pt. 15-17
MANUFACTURING	
13 Ordnance and accessories	
13.0100 Complete guided missiles	3761
13.0200 Ammunition, except for small arms, n.e.c.	3483
13.0300 Tanks and tank components	3795
13.0500 Small arms	3484
13.0600 Small arms ammunition	3482
13.0700 Other ordnance and accessories	3489
14 Food and kindred products	
14.0101 Meat packing plants	2011
14.0102 Sausages and other prepared meats	2013
14.0103 Poultry dressing plants	2016
14.0104 Poultry and egg processing	2017
14.0200 Creamery butter	2021
14.0300 Cheese, natural and processed	2022
14.0400 Condensed and evaporated milk	2023
14.0500 Ice cream and frozen desserts	2024
14.0600 Fluid milk	2026
14.0700 Canned and cured sea foods	2091
14.0800 Canned specialties	2032
14.0900 Canned fruits and vegetables	2033
14.1000 Dehydrated food products	2034
14.1100 Pickles, sauces, and salad dressings	2035
14.1200 Fresh or frozen packaged fish	2092
14.1300 Frozen fruits and vegetables	2037-9
14.1401 Flour and other grain mill products	2041
14.1402 Cereal preparations	2043
14.1403 Blended and prepared flour	2045
14.1501 Dog, cat, and other pet food	2047
14.1502 Prepared feeds, n.e.c.	2048
14.1600 Rice milling	2044
14.1700 Wet corn milling	2046
14.1801 Bread, cake, and related products	2051
14.1802 Cookies and crackers	2052
14.1900 Sugar	2061-3
14.2001 Confectionery products	2065
14.2002 Chocolate and cocoa products	2066
14.2003 Chewing gum	2067
14.2101 Malt liquors	2082
14.2102 Malt	2083
14.2103 Wines, brandy, and brandy spirits	2084
14.2104 Distilled liquor, except brandy	2085
14.2200 Bottled and canned soft drinks	2086
14.2300 Flavoring extracts and syrups, n.e.c.	2087
14.2400 Cottonseed oil mills	2074
14.2500 Soybean oil mills	2075

see footnote at end

(Continued)

Source: *The Detailed Input-Output Structure of the U.S. Economy: 1972*, Volumes I and II, U.S. Department of Commerce, 1979.

Table A-3. (Continued)

Industry Classification of the 1972 Input-Output Tables[1]—Continued

Industry number and title	Related Census-SIC codes (1972 edition)
14.2900 Vegetable oil mills, n.e.c.	2076
14.2700 Animal and marine fats and oils	2077
14.2800 Roasted coffee	2095
14.2900 Shortening and cooking oils	2079
14.3000 Manufactured ice	2097
14.3100 Macaroni and spaghetti	2098
14.3200 Food preparations, n.e.c.	2099
15 Tobacco manufactures	
15.0101 Cigarettes	211
15.0102 Cigars	212
15.0103 Chewing and smoking tobacco	213
15.0200 Tobacco stemming and redrying	214
16 Broad and narrow fabrics, yarn and thread mills	
16.0100 Broadwoven fabric mills and fabric finishing plants	221-3, 2261-2
16.0200 Narrow fabric mills	224
16.0300 Yarn mills and finishing of textiles, n.e.c.	2269, 2281-3
16.0400 Thread mills	2284
17 Miscellaneous textile goods and floor coverings	
17.0100 Floor coverings	227
17.0200 Felt goods, n.e.c.	2291
17.0300 Lace goods	2292
17.0400 Padding and upholstery filling	2293
17.0500 Processed textile waste	2294
17.0600 Coated fabrics, not rubberized	2295
17.0700 Tire cord and fabric	2296
17.0800 Cordage and twine	2298
17.1001 Nonwoven fabrics	2297
17.1002 Textile goods, n.e.c.	2299
18 Apparel	
18.0101 Women's hosiery, except socks	2251
18.0102 Hosiery, n.e.c.	2252
18.0201 Knit outerwear mills	2253
18.0202 Knit underwear mills	2254
18.0203 Knitting mills, n.e.c.	2259
18.0300 Knit fabric mills	2257-8
18.0400 Apparel made from purchased materials	231-9, 3999[6]
19 Miscellaneous fabricated textile products	
19.0100 Curtains and draperies	2391
19.0200 Housefurnishings, n.e.c.	2392
19.0301 Textile bags	2393
19.0302 Canvas products	2394
19.0303 Pleating and stitching	2395
19.0304 Automotive and apparel trimmings	2396
19.0305 Schiffli machine embroideries	2397
19.0306 Fabricated textile products, n.e.c.	2399
20 Lumber and wood products, except containers	
20.0100 Logging camps and logging contractors	2411
20.0200 *Sawmills and planing mills, general*	2421
20.0300 Hardwood dimension and flooring mills	2426
20.0400 Special product sawmills, n.e.c.	2429
20.0501 Millwork	2431
20.0502 Wood kitchen cabinets	2434
20.0600 Veneer and plywood	2435-6
20.0701 Structural wood members, n.e.c.	2439
20.0702 Prefabricated wood buildings	2452
20.0800 Wood preserving	2491
20.0901 Wood pallets and skids	2448
20.0902 Particleboard	2492
20.0903 Wood products, n.e.c.	2499
21 Wood containers	
21.0000 Wood containers	2441, 2449
22 Household furniture	
22.0101 Wood household furniture	2511
22.0102 Household furniture, n.e.c.	2519
22.0103 Wood TV and radio cabinets	2517
22.0200 Upholstered household furniture	2512
22.0300 Metal household furniture	2514
22.0400 Mattresses and bedsprings	2515
23 Other furniture and fixtures	
23.0100 Wood office furniture	2521
23.0200 Metal office furniture	2522
23.0300 Public building furniture	2531
23.0400 Wood partitions and fixtures	2541
23.0500 Metal partitions and fixtures	2542
23.0600 Blinds, shades, and drapery hardware	2591
23.0700 Furniture and fixtures, n.e.c.	2599
24 Paper and allied products, except containers and boxes	
24.0100 Pulp mills	261
24.0200 Paper mills, except building paper	262
24.0300 Paperboard mills	263
24.0400 Envelopes	2642
24.0500 Sanitary paper products	2647
24.0902 Building paper and board mills	266
24.0701 Paper coating and glazing	2641
24.0702 Bags, except textile	2643
24.0703 Die-cut paper and board	2645
24.0704 Pressed and molded pulp goods	2646
24.0705 Stationery products	2648
24.0706 Converted paper products, n.e.c.	2649
25 Paperboard containers and boxes	
25.0000 Paperboard containers and boxes	265

Industry number and title	Related Census-SIC codes (1972 edition)
26 Printing and publishing	
26.0100 Newspapers	271
26.0200 *Periodicals*	272
26.0301 Book publishing	2731
26.0302 Book printing	2732
26.0400 Miscellaneous publishing	274
26.0501 Commercial printing	2751-2, 2754
26.0502 Lithographic platemaking and services	2796
26.0601 Manifold business forms	276
26.0602 Blankbooks and looseleaf binders	2782
26.0700 Greeting card publishing	277
26.0801 Engraving and plate printing	2753
26.0802 Bookbinding and related work	2789
26.0803 Typesetting	2791
26.0804 *Photoengraving*	2793
26.0805 Electrotyping and stereotyping	2794
27 Chemicals and selected chemical products	
27.0100 Industrial inorganic and organic chemicals	281 (excl. 28195), 2865, 2869
27.0201 Nitrogenous and phosphatic fertilizers	2873-4
27.0202 Fertilizers, mixing only	2875
27.0300 Agricultural chemicals, n.e.c.	2879
27.0401 Gum and wood chemicals	2861
27.0402 Adhesives and sealants	2891
27.0403 Explosives	2892
27.0404 Printing ink	2893
27.0405 *Carbon black*	2895
27.0406 Chemical preparations, n.e.c.	2899
28 Plastics and synthetic materials	
28.0100 Plastics materials and resins	2821
28.0200 Synthetic rubber	2822
28.0300 Cellulosic man-made fibers	2823
28.0400 Organic fibers, noncellulosic	2824
29 Drugs, cleaning and toilet preparations	
29.0100 Drugs	283
29.0201 Soap and other detergents	2841
29.0202 Polishes and sanitation goods	2842
29.0203 *Surface active agents*	2843
29.0300 Toilet preparations	2844
30 Paints and allied products	
30.0000 Paints and allied products	285
31 Petroleum refining and related industries	
31.0100 Petroleum refining and miscellaneous products of petroleum and coal	291, 299
31.0200 Paving mixtures and blocks	2951
31.0300 Asphalt felts and coatings	2952
32 Rubber and miscellaneous plastics products	
32.0100 *Tires and inner tubes*	301
32.0200 Rubber and plastics footwear	302
32.0301 Reclaimed rubber	303
32.0302 Fabricated rubber products, n.e.c.	306
32.0400 Miscellaneous plastics products	307
32.0500 Rubber and plastics hose and belting	304
33 Leather tanning and finishing	
33.0001 Leather tanning and finishing	311
34 Footwear and other leather products	
34.0100 Footwear cut stock	313
34.0201 Shoes, except rubber	3143-4, 3149
34.0202 House slippers	3142
34.0301 Leather gloves and mittens	315
34.0302 Luggage	316
34.0303 Women's handbags and purses	3171
34.0304 Personal leather goods	3172
34.0305 Leather goods, n.e.c.	319
35 Glass and glass products	
35.0100 Glass and glass products, except containers	321, 3229, 323
35.0200 Glass containers	3221
36 Stone and clay products	
36.0100 Cement, hydraulic	324
36.0200 Brick and structural clay tile	3251
36.0300 Ceramic wall and floor tile	3253
36.0400 Clay refractories	3255
36.0500 Structural clay products, n.e.c.	3259
36.0600 Vitreous plumbing fixtures	3261
36.0701 Vitreous china food utensils	3262
36.0702 Fine earthenware food utensils	3263
36.0800 Porcelain electrical supplies	3264
36.0900 Pottery products, n.e.c.	3269
36.1000 Concrete block and brick	3271
36.1100 Concrete products, n.e.c.	3272
36.1200 Ready-mixed concrete	3273
36.1300 Lime	3274
36.1400 Gypsum products	3275
36.1500 Cut stone and stone products	328
36.1600 Abrasive products	3291
36.1700 Asbestos products	3292
36.1800 Gaskets, packing and sealing devices	3293
36.1900 Minerals, ground or treated	3295
36.2000 Mineral wool	3296
36.2100 Nonclay refractories	3297
36.2200 Nonmetallic mineral products, n.e.c.	3299
37 Primary iron and steel manufacturing	
37.0101 Blast furnaces and steel mills	3312
37.0102 Electrometallurgical products	3313

See footnotes at end

(Continued)

Table A-3. (Continued)

Industry Classification of the 1972 Input-Output Tables[1]—Continued

Industry number and title	Related Census-SIC codes 1972 edition
37.0103 Steel wire and related products	3315
37.0104 Cold finishing of steel shapes	3316
37.0105 Steel pipe and tubes	3317
37.0200 Iron and steel foundries	332
37.0300 Iron and steel forgings	3462
37.0401 Metal heat treating	3398
37.0402 Primary metal products, n.e.c.	3399
38 Primary nonferrous metals manufacturing	
38.0100 Primary copper	3331
38.0200 Primary lead	3332
38.0300 Primary zinc	3333
38.0400 Primary aluminum	3334, 28195
38.0500 Primary nonferrous metals, n.e.c.	3339
38.0600 Secondary nonferrous metals	334
38.0700 Copper rolling and drawing	3351
38.0800 Aluminum rolling and drawing	3353-5
38.0900 Nonferrous rolling and drawing, n.e.c.	3356
38.1000 Nonferrous wire drawing and insulating	3357
38.1100 Aluminum castings	3361
38.1200 Brass, bronze, and copper castings	3362
38.1300 Nonferrous castings, n.e.c.	3369
38.1400 Nonferrous forgings	3463
39 Metal containers	
39.0100 Metal cans	3411
39.0200 Metal barrels, drums, and tanks	3412
40 Heating, plumbing, and fabricated structural metal products	
40.0100 Metal sanitary ware	3431
40.0200 Plumbing fixture fittings and trim	3432
40.0300 Heating equipment, except electric	3433
40.0400 Fabricated structural metal	3441
40.0500 Metal doors, sash, and trim	3442
40.0600 Fabricated plate work (boiler shops)	3443
40.0700 Sheet metal work	3444
40.0800 Architectural metal work	3446
40.0901 Prefabricated metal buildings	3448
40.0902 Miscellaneous metal work	3449
41 Screw machine products and stampings	
41.0100 Screw machine products and bolts, nuts, rivets, and washers	345
41.0201 Automotive stampings	3465
41.0202 Crowns and closures	3466
41.0203 Metal stampings, n.e.c.	3469
42 Other fabricated metal products	
42.0100 Cutlery	3421
42.0201 Hand and edge tools, n.e.c.	3423
42.0202 Hand saws and saw blades	3425
42.0300 Hardware, n.e.c.	3429
42.0401 Plating and polishing	3471
42.0402 Metal coating and allied services	3479
42.0500 Miscellaneous fabricated wire products	3495-6
42.0700 Steel springs, except wire	3493
42.0800 Pipe, valves, and pipe fittings	3494, 3498
42.1000 Metal foil and leaf	3497
42.1100 Fabricated metal products, n.e.c.	3499
43 Engines and turbines	
43.0100 Steam engines and turbines	3511
43.0200 Internal combustion engines, n.e.c.	3519
44 Farm and garden machinery	
44.0001 Farm machinery and equipment	3523
44.0002 Lawn and garden equipment	3524
45 Construction and mining machinery	
45.0100 Construction machinery and equipment	3531
45.0200 Mining machinery, except oilfield	3532
45.0300 Oilfield machinery	3533
46 Materials handling machinery and equipment	
46.0100 Elevators and moving stairways	3534
46.0200 Conveyors and conveying equipment	3535
46.0300 Hoists, cranes, and monorails	3536
46.0400 Industrial trucks and tractors	3537
47 Metalworking machinery and equipment	
47.0100 Machine tools, metal cutting types	3541
47.0200 Machine tools, metal forming types	3542
47.0300 Special dies and tools and machine tool accessories	3544-5
47.0401 Power driven hand tools	3546
47.0402 Rolling mill machinery	3547
47.0403 Metalworking machinery, n.e.c.	3549
48 Special industry machinery and equipment	
48.0100 Food products machinery	3551
48.0200 Textile machinery	3552
48.0300 Woodworking machinery	3553
48.0400 Paper industries machinery	3554
48.0500 Printing trades machinery	3555
48.0600 Special industry machinery, n.e.c.	3559
49 General industrial machinery and equipment	
49.0100 Pumps and compressors	3561, 3563
49.0200 Ball and roller bearings	3562
49.0301 Blowers and fans	3564
49.0400 Industrial patterns	3565
49.0500 Power transmission equipment	3566, 3568
49.0600 Industrial furnaces and ovens	3567
49.0700 General industrial machinery, n.e.c.	3569
50 Miscellaneous machinery, except electrical	
50.0001 Carburetors, pistons, rings, valves	3592
50.0002 Machinery, except electrical, n.e.c.	3599
51 Office, computing, and accounting machines	
51.0101 Electronic computing equipment	3573
51.0102 Calculating and accounting machines	3574
51.0200 Typewriters	3572
51.0300 Scales and balances	3576
51.0400 Office machines, n.e.c.	3579
52 Service industry machines	
52.0100 Automatic merchandising machines	3581
52.0200 Commercial laundry equipment	3582
52.0300 Refrigeration and heating equipment	3585
52.0400 Measuring and dispensing pumps	3586
52.0500 Service industry machines, n.e.c.	3589
53 Electric transmission and distribution equipment and industrial apparatus	
53.0100 Instruments to measure electricity	3825
53.0200 Transformers	3612
53.0300 Switchgear and switchboard apparatus	3613
53.0400 Motors and generators	3621
53.0500 Industrial controls	3622
53.0600 Welding apparatus, electric	3623
53.0700 Carbon and graphite products	3624
53.0800 Electrical industrial apparatus, n.e.c.	3629
54 Household appliances	
54.0100 Household cooking equipment	3631
54.0200 Household refrigerators and freezers	3632
54.0300 Household laundry equipment	3633
54.0400 Electric housewares and fans	3634
54.0500 Household vacuum cleaners	3635
54.0600 Sewing machines	3636
54.0700 Household appliances, n.e.c.	3639
55 Electric lighting and wiring equipment	
55.0100 Electric lamps	3641
55.0200 Lighting fixtures and equipment	3645-6
55.0300 Wiring devices	3643-4
56 Radio, TV, and communication equipment	
56.0100 Radio and TV receiving sets	3651
56.0200 Phonograph records and tape	3652
56.0300 Telephone and telegraph apparatus	3661
56.0400 Radio and TV communication equipment	3662
57 Electronic components and accessories	
57.0100 Electron tubes	3671-3
57.0200 Semiconductors and related devices	3674
57.0300 Electronic components, n.e.c.	3675-9
58 Miscellaneous electrical machinery, equipment, and supplies	
58.0100 Storage batteries	3691
58.0200 Primary batteries, dry and wet	3692
58.0300 X-ray apparatus and tubes	3693
58.0400 Engine electrical equipment	3694
58.0800 Electrical equipment, n.e.c.	3699
59 Motor vehicles and equipment	
59.0100 Truck and bus bodies	3713
59.0200 Truck trailers	3715
59.0301 Motor vehicles	3711
59.0302 Motor vehicle parts and accessories	3714
60 Aircraft and parts	
60.0100 Aircraft	3721
60.0200 Aircraft and missile engines and engine parts	3724, 3764
60.0400 Aircraft and missile equipment, n.e.c.	3728, 3769
61 Other transportation equipment	
61.0100 Ship building and repairing	3731
61.0200 Boat building and repairing	3732
61.0300 Railroad equipment	374
61.0500 Motorcycles, bicycles, and parts	375
61.0601 Travel trailers and campers	3792
61.0602 Mobile homes	2451
61.0700 Transportation equipment, n.e.c.	3799
62 Professional, scientific, and controlling instruments and supplies	
62.0100 Engineering and scientific instruments	3811
62.0200 Mechanical measuring devices	3823-4, 3829
62.0300 Automatic temperature controls	3822
62.0400 Surgical and medical instruments	3841
62.0500 Surgical appliances and supplies	3842
62.0600 Dental equipment and supplies	3843
62.0700 Watches, clocks, and parts	387
63 Optical, ophthalmic, and photographic equipment and supplies	
63.0100 Optical instruments and lenses	383
63.0200 Ophthalmic goods	385
63.0300 Photographic equipment and supplies	386
64 Miscellaneous manufacturing	
64.0101 Jewelry, precious metal	3911
64.0102 Jewelers materials and lapidary work	3915
64.0104 Silverware and plated ware	3914
64.0105 Costume jewelry	3961
64.0200 Musical instruments	393
64.0301 Games, toys, and children's vehicles	3944
64.0302 Dolls	3942

See footnote at end of Appendix I.

(Continued)

Table A-3. (Concluded)

Industry Classification of the 1972 Input-Output Tables[1]—Continued

Industry number and title	Related Census-SIC codes (1972 edition)
64.0400 Sporting and athletic goods, n.e.c.	3949
64.0501 Pens and mechanical pencils	3951
64.0502 Lead pencils and art goods	3952
64.0503 Marking devices	3953
64.0504 Carbon paper and inked ribbons	3955
64.0600 Artificial trees and flowers	3962
64.0701 Buttons	3963
64.0702 Needles, pins, and fasteners	3964
64.0800 Brooms and brushes	3991
64.0900 Hard surface floor coverings	3996
64.1000 Burial caskets and vaults	3995
64.1100 Signs and advertising displays	3993
64.1200 Manufacturing industries, n.e.c.	3999 (excl. 39996)
TRANSPORTATION, COMMUNICATION, AND UTILITIES	
65 Transportation and warehousing[2]	
65.0100 Railroads and related services	40, 474, pt. 4789
65.0200 Local, suburban, and interurban highway passenger transportation	41
65.0300 Motor freight transportation and warehousing	42, pt. 4789
65.0400 Water transportation	44
65.0500 Air transportation	45
65.0600 Pipelines, except natural gas	46
65.0700 Transportation services	47 excl. 474 and pt. 4789)
66 Communications, except radio and TV	
66.0000 Communications, except radio and TV	48 (excl. 483)
67 Radio and TV broadcasting	
67.0000 Radio and TV broadcasting	483
68 Electric, gas, water, and sanitary services[2]	
68.0100 Electric services (utilities)	491, pt. 493
68.0200 Gas production and distribution (utilities)	492, pt. 493
68.0300 Water supply and sanitary services	494–7, pt. 493
WHOLESALE AND RETAIL TRADE *	
69 Wholesale and retail trade	
69.0100 Wholesale trade	50, 51 (excl. manufacturers' sales offices)
69.0200 Retail trade	52–7, 59, 7396, 8042
FINANCE, INSURANCE, AND REAL ESTATE	
70 Finance and insurance[2]	
70.0100 Banking	60
70.0200 Credit agencies	61 (excl. pt. 613), 67
70.0300 Security and commodity brokers	62
70.0400 Insurance carriers	63
70.0500 Insurance agents and brokers	64
71 Real estate and rental	
71.0100 Owner-occupied dwellings	not applicable
71.0200 Real estate	65–6, pt. 1531
SERVICES	
72 Hotels and lodging, personal and repair services (except auto)	
72.0100 Hotels and lodging places	70 (excl. dining)
72.0200 Personal and repair services, except auto repair and beauty and barber shops	72 (excl. 723–4), 762–4, pt. 7699
72.0300 Beauty and barber shops	723–4
73 Business services	
73.0100 Miscellaneous business services	732–9 (excl. 7396), 7692, 7694, pt. 7699
73.0200 Advertising	731
73.0300 Miscellaneous professional services	81, 89 (excl. 8922)
74 Eating and drinking places	
74.0000 Eating and drinking places	58, pt. 70
75 Automobile repair and services	
75.0000 Automobile repair and services	75
76 Amusements	
76.0100 Motion pictures	78
76.0200 Amusement and recreation services	79
77 Health, educational, and social services and nonprofit organizations	
77.0100 Doctors and dentists	801–3, 8041
77.0200 Hospitals	806
77.0300 Other medical and health services	074, 8049, 805, 807–9
77.0400 Educational services	82
77.0500 Nonprofit organizations	84, 86, 8922
77.0600 Job training and related services	4331
77.0700 Child day care services	8351
77.0800 Residential care	8361
77.0900 Social services, n.e.c.	8321, 8399
GOVERNMENT ENTERPRISES	
78 Federal Government enterprises	
78.0100 U.S. Postal Service	4311
78.0200 Federal electric utilities	pt. 491
78.0300 Commodity Credit Corporation	pt. 613
78.0400 Other Federal Government enterprises	several[3]
79 State and local government enterprises	
79.0100 Local government passenger transit	pt. 41
79.0200 State and local electric utilities	pt. 491
79.0300 Other State and local government enterprises	several[3]
DUMMY AND SPECIAL INDUSTRIES	
80 Noncomparable imports	
80.0000 Noncomparable imports	
81 Scrap, used, and secondhand goods	
81.0000 Scrap, used, and secondhand goods	
82 Government industry	
82.0000 Government industry	
83 Rest of the world industry	
83.0000 Rest of the world industry	
84 Household industry	
84.0000 Household industry	
85 Inventory valuation adjustment	
85.0000 Inventory valuation adjustment	
VALUE ADDED AND FINAL DEMAND	
V.A. Value added, total	
58 Employee compensation	
89 Indirect business taxes	
90 Property-type income	
91 Personal consumption expenditures	
91.0000 Personal consumption expenditures	
92 Gross private domestic fixed investment	
92.0000 Gross private domestic fixed investment	
93 Change in business inventories	
93.0000 Change in business inventories	
94 Exports	
94.0000 Exports	
95 Imports	
95.0000 Imports	
96 Federal Government purchases, national defense	
96.0000 Federal Government purchases, national defense	
97 Federal Government purchases, nondefense	
97.0000 Federal Government purchases, nondefense	
98 State and local government purchases, education	
98.0000 State and local government purchases, education	
99 State and local government purchases, other	
99.1000 State and local government purchases, health, welfare, and sanitation	
99.2000 State and local government purchases, safety	
99.3000 State and local government purchases, other general government	
OTHER SYMBOLS	
Outputs	
T I U Total intermediate use	
T F D Total final demand	
T C O Total commodity output	
Inputs	
T I I Total intermediate inputs	
V A Value added	
T I O Total industry output	

1 The industry classification is usually identical with that for the commodity which is the primary product of the industry. However, for some industries the principal product or a component thereof, is the same as the primary product of another industry. In such cases, commodity output is coupled with the industry most characteristically associated with the commodity, usually the largest producer.

2 Excluding government enterprises.

3 In the 1972 I-O government enterprise activities are generally classified with the similar private activity. In I-O, activities of enterprises are classified in groups 78 and 79 and the corresponding SIC's are shown except for 78.0400 and 79.0300, each of which includes a number of SIC's and several activities for which no comparable SIC exists.

Table A-4. COMMODITIES WITH NO NONZERO COMMODITY--COMMODITY COEFFICIENTS

Sector	ID Number	Sector Name
1.	2.0701	Forest Products
2.	78.0200	Federal Electric Utilities
3.	78.0300	Commodity Credit Corporation
4.	79.0100	Local Government Passenger Transit
5.	79.0200	State and Local Electric Utilities
6.	80.0000	Noncomparable Imports
7.	81.0000	Scrap, Used, and Secondhand Goods
8.	82.0000	Government Industry
9.	83.0000	Rest of the World Industry
10.	84.0000	Household Industry
11.	85.0000	Inventory Valuation Adjustment

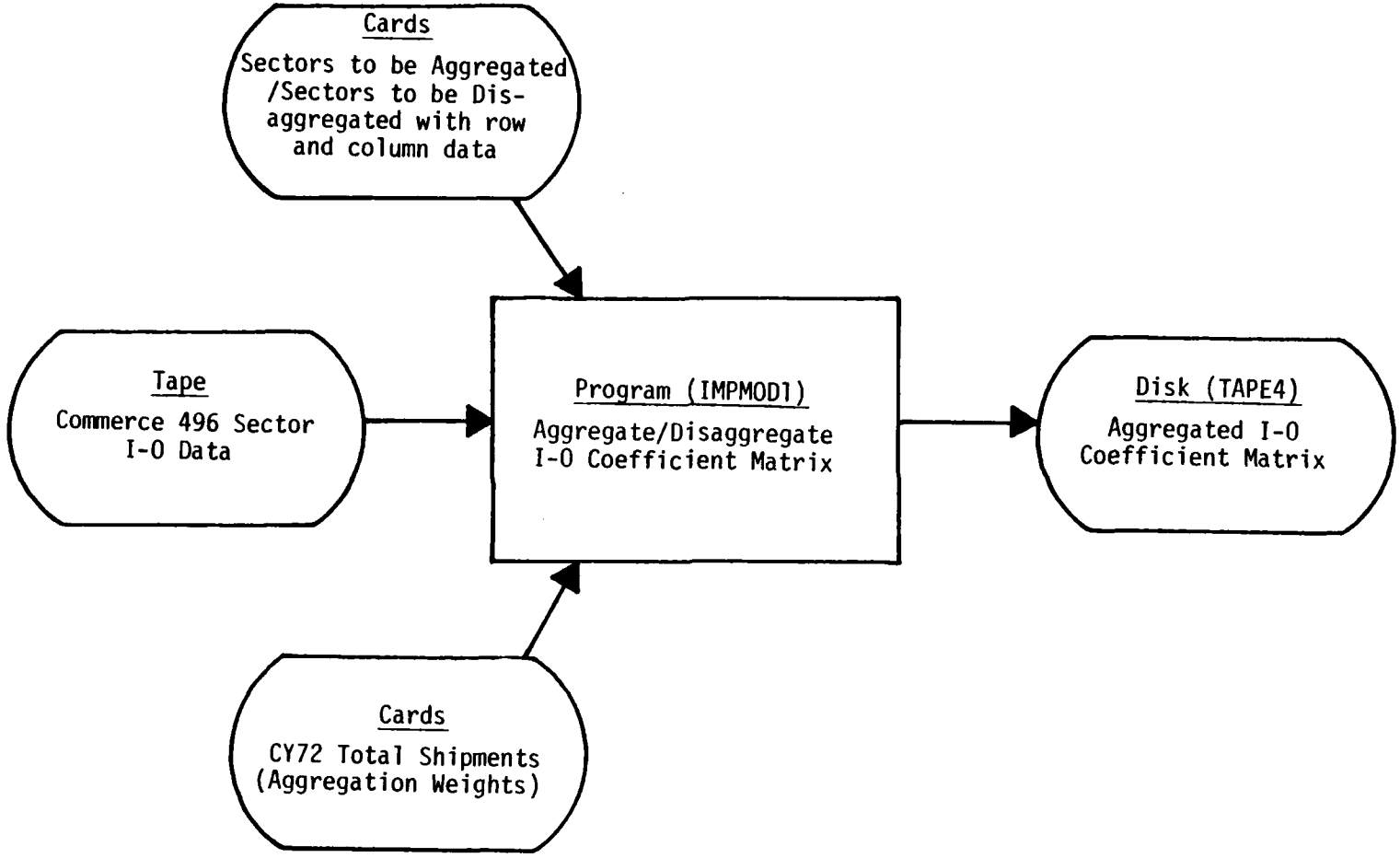


Figure A-2. PROGRAM IMPMOD1

C. PROGRAM IMPMOD2 - INVERT THE I-O COEFFICIENT MATRIX

The program IMPMOD2 accesses the [illegible] stored on Disk File TAPE4, forms the [illegible], calculates its inverse, and stores that inverse [illegible] File TAPE3 to be used by other programs in [illegible] requirements.

The inverse is calculated using LU decomposition. The matrix B = I-A is first decomposed using Gaussian elimination into the product of a lower triangular matrix, L, and an upper triangular matrix, U:

$$B = LU \quad \text{and} \quad B^{-1} = U^{-1}L^{-1} .$$

Once this is done, a representation of the basis inverse is immediate since the inverse of a triangular matrix is a simple rearrangement of the matrix itself. As an example

$$U^{-1} = \begin{bmatrix} u_{11} & u_{12} & u_{13} \\ 0 & u_{22} & u_{23} \\ 0 & 0 & u_{33} \end{bmatrix}^{-1} = \begin{bmatrix} 1/u_{11} & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & -u_{12}/u_{22} & 0 \\ 0 & 1/u_{22} & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & -u_{13}/u_{33} \\ 0 & 1 & -u_{23}/u_{33} \\ 0 & 0 & 1/u_{33} \end{bmatrix}$$

and likewise for L^{-1}. The representation of the inverse can now be written as the product of elementary column matrices E_t (often called eta vectors):

$$B^{-1} = \underbrace{E_t \cdots}_{U^{-1}} \underbrace{E_2 E_1}_{L^{-1}}$$

with

$$E_t = \begin{bmatrix} 1 & & & \eta_1 & \\ & \ddots & & \vdots & \\ & & \ddots & \eta_p & \\ & & & \vdots & \ddots \\ & & & \eta_m & 1 \end{bmatrix} .$$

It is these eta vectors which are stored on the Disk File TAPE3. By doing so, much space is saved as some of the sparsity in the original matrix is retained by this representation of the inverse. When A was aggregated to 250 commodities, I-A had 22,459 nonzero elements. In this case the eta vector representation of the inverse had 43,766 nonzero elements, whereas the full inverse would require close to 62,500 nonzero elements. Figure A-3 displays the inputs and outputs of program IMPMOD2.

D. PROGRAM IMPMOD3

Program IMPMOD3 calculates and plots the technology network implicit in the input-output table. Particularly for defense items, it is important to see which commodities are most important in producing the final item and when in the production process they are required. The network plots are twenty commodities wide, due to the limited width of the graph paper. At each tier those twenty paths are followed which have the largest dollar flow. For commodity i the largest dollar flow path, P, through six tiers is:

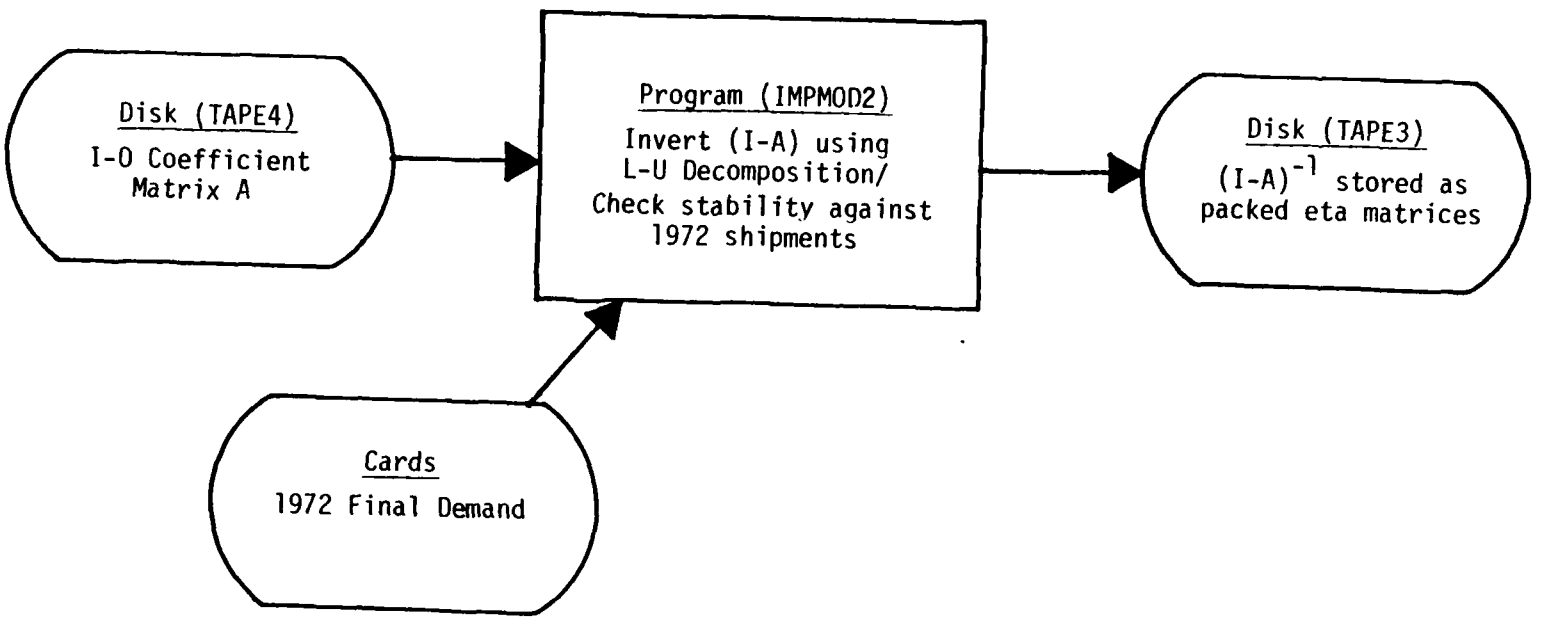


Figure A-3. PROGRAM IMPMOD2

$$\text{largest dollar flow path} = \max_{\substack{\text{all } P=(i_1,i_2,\ldots,i_6) \\ \text{s.t. } i_1=i}} \prod_{k=2}^{6} a_{i_k i_{k-1}} .$$

Figure A-4 displays the inputs and outputs of IMPMOD3.

E. PROGRAM IMPMOD4--TIME-PHASED REQUIREMENTS FOR DEFENSE PURCHASES

Program IMPMOD4 calculates time-phased commodity requirements for a given pattern of defense purchases and stores them on Disk File TAPE2 to be used by IMPMOD5. In a static input-output model for a final demand vector, F, total direct and indirect requirements represented by X can be calculated as follows:

$$X = (I-A)^{-1}F$$

$$= \underset{\substack{\uparrow \\ \text{direct} \\ \text{req.}}}{F} + \underset{\substack{\uparrow \\ \text{1st} \\ \text{tier} \\ \text{req.}}}{AF} + \underset{\substack{\uparrow \\ \text{2nd} \\ \text{tier} \\ \text{req.}}}{A^2F} + \underset{\substack{\uparrow \\ \text{3rd} \\ \text{tier} \\ \text{req.}}}{A^3F} + \ldots$$

As all commodities have positive value-added, the infinite series converges. IMPMOD4 starts with direct requirements and works through the lower tiers by first computing the indirect requirements at that tier and then time-lagging them by the amount of that commodity's process time.

Let p_i = process time of commodity i, and

x_i^t = total direct and indirect requirements at time t for commodity i;

then the recursion used in calculating x_i^t is

$$x_i^t = \sum_{\substack{\text{all} \\ \text{commodities} \\ j}} \sum_{\substack{\text{all time} \\ \text{periods } s \\ \text{s.t. } s+p_i=t}} x_j^s * a_{ij} + \begin{pmatrix} f_i \\ \text{if} \\ p_i=t \end{pmatrix} .$$

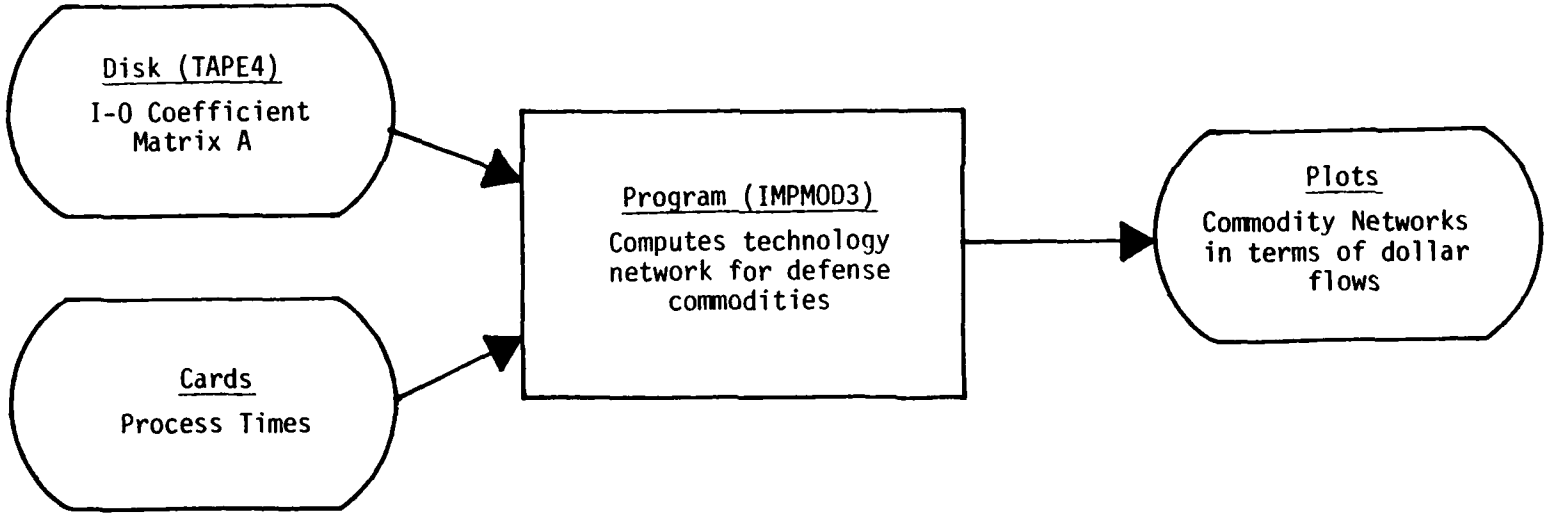


Figure A-4. PROGRAM IMPMOD3

Letting NTIME be the time horizon,

$$\text{total requirements} = X_i = \sum_{t=1}^{NTIME} x_i^t$$

To estimate how much of total requirements has been captured in this time-phasing process, $\bar{X} = (I-A)^{-1}F$ is calculated using TAPE3. X should equal $\bar{X}$ if NTIME is infinity, otherwise X will be less than $\bar{X}$ for finite NTIME. $X_i/\bar{X}_i$ is displayed for each commodity i. Figure A-5 displays the inputs and outputs of IMPMOD5.

F. PROGRAM IMPMOD5 - TOTAL REQUIREMENTS MATCHED AGAINST CAPACITY

Program IMPMOD5 plots requirements over the time interval FY81 to FY90 for each commodity. Major inputs are the increased defense expenditures in millions of dollars and the period of time over which end item deliveries are desired. Outputs are the following four curves:

- estimated non-defense consumption,
- estimated total requirements due to defense FYDP expenditures,
- estimated total requirements due to the assumed surge in defense spending, and
- estimated U.S. production capacity.

Figure A-6 shows the inputs and outputs for IMPMOD5.

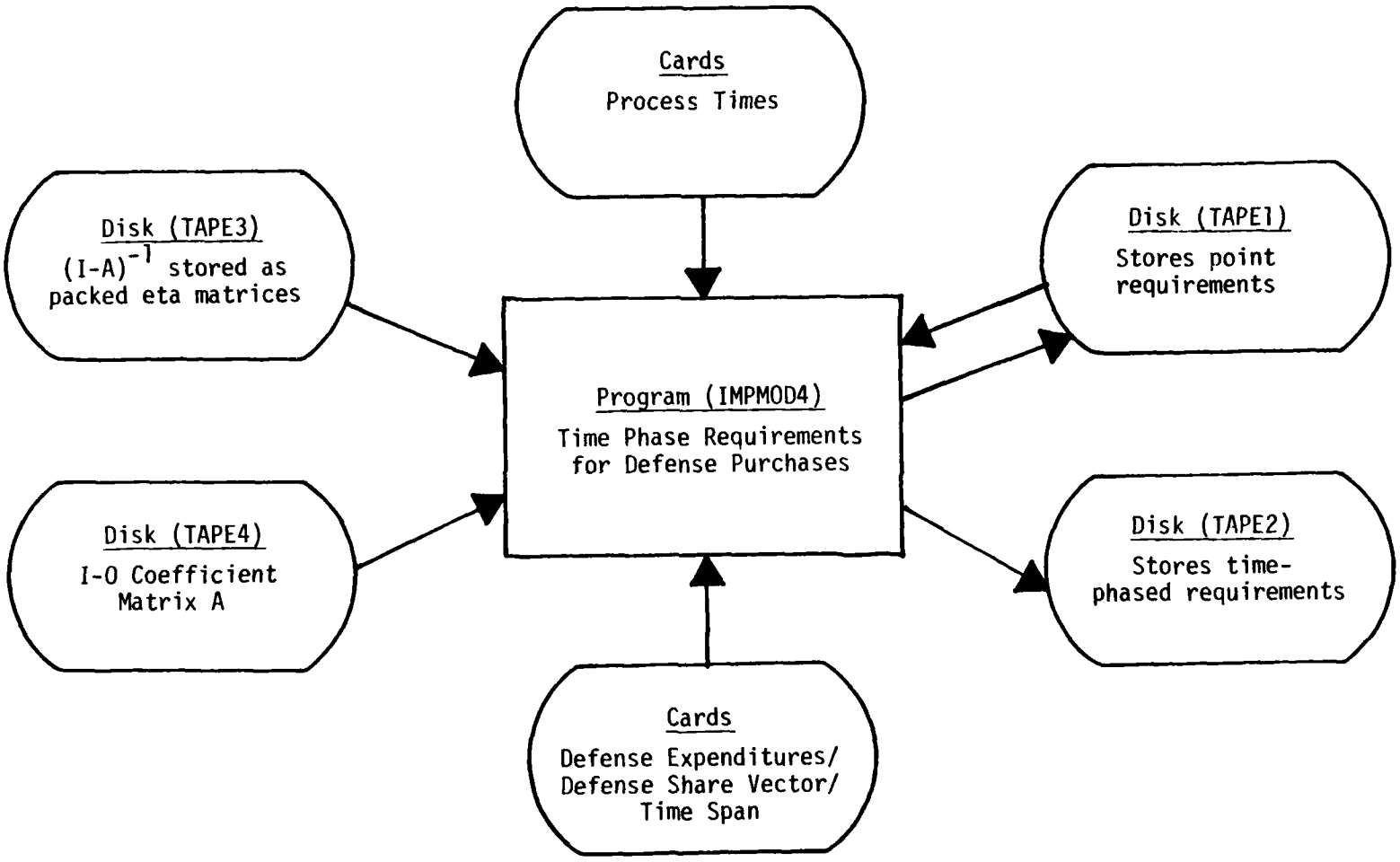


Figure A-5. PROGRAM IMPMOD4

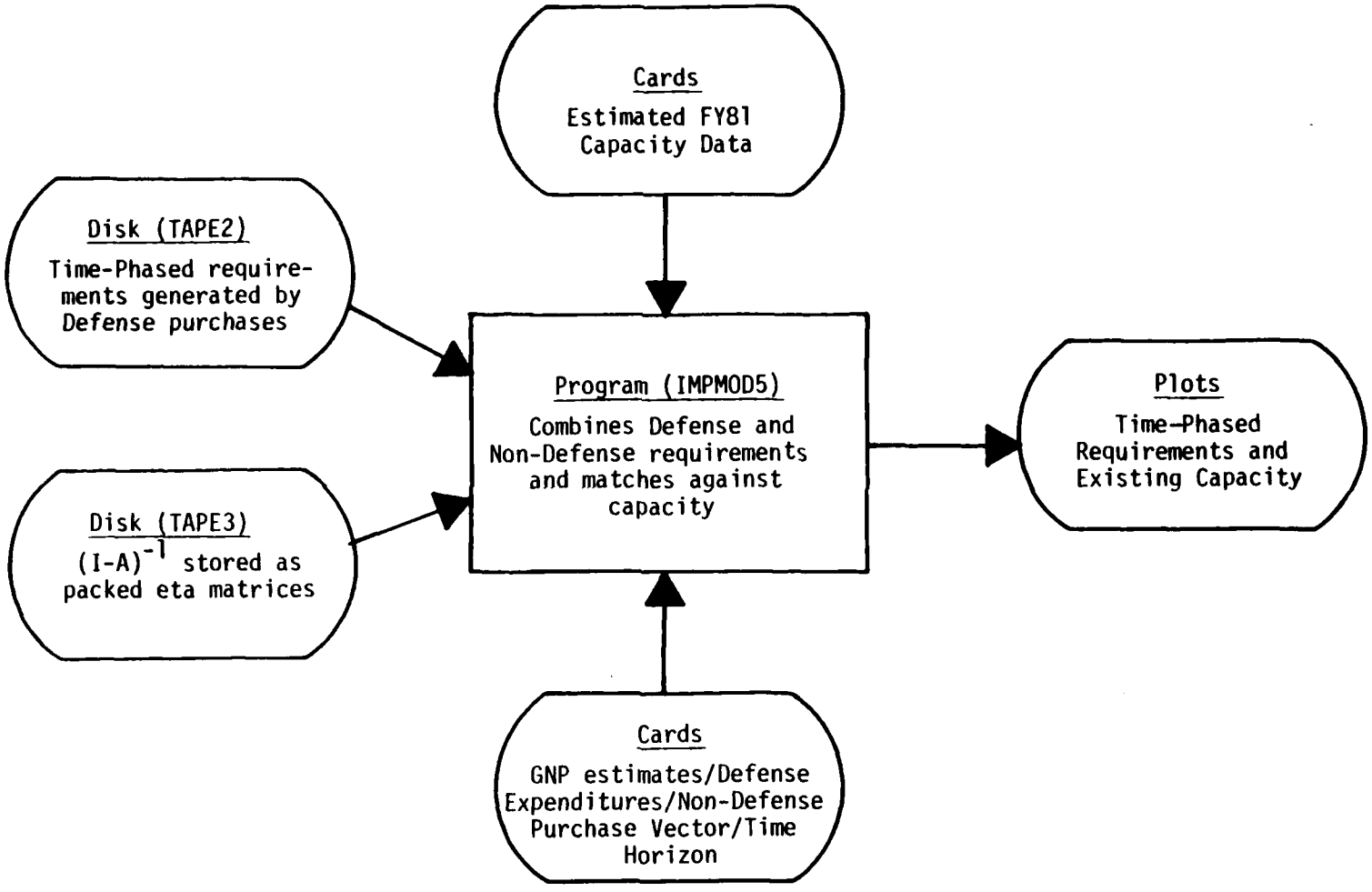


Figure A-6. PROGRAM IMPMOD5

APPENDIX B

CRITICAL PATH NETWORKS FOR MAJOR DEFENSE COMMODITIES

CRITICAL PATH NETWORKS FOR MAJOR DEFENSE COMMODITIES

This appendix presents critical path networks for eight commodities which include the major weapons and components purchased by DoD. For each item, six columns of requirements are shown. The first column displays the direct requirements (per dollar of sales) of the 20 most significant commodities required in producing the end item. Subsequent columns contain the indirect requirements of successive industrial tiers. Again, the 20 commodities with the largest (dollar) requirements for each stage of production are shown.

The most important supplier commodity appears in the lowest row of each tier. As one moves up the column, the significance of the commodity diminishes. Each box contains three numbers. The number in the upper left-hand corner is the value of the supplied commodity required per dollar of sales of the produced commodity. The number in the upper right-hand corner is the value-added coefficient for the commodity. This represents the fraction of the costs of producing the supplied commodity which is not spent on other material requirements. The number in the lower right-hand corner is the fraction of requirements for the production of the supplied commodity not accounted for in the subsequent production tier.

These charts may be used to (1) determine the most important lower-tier industries associated with each class of weapon system and (2) to determine the interrelationships between purchaser and supplier industries. The lines connecting the boxes assist the latter process by identifying direct relationships among the various subtiers.

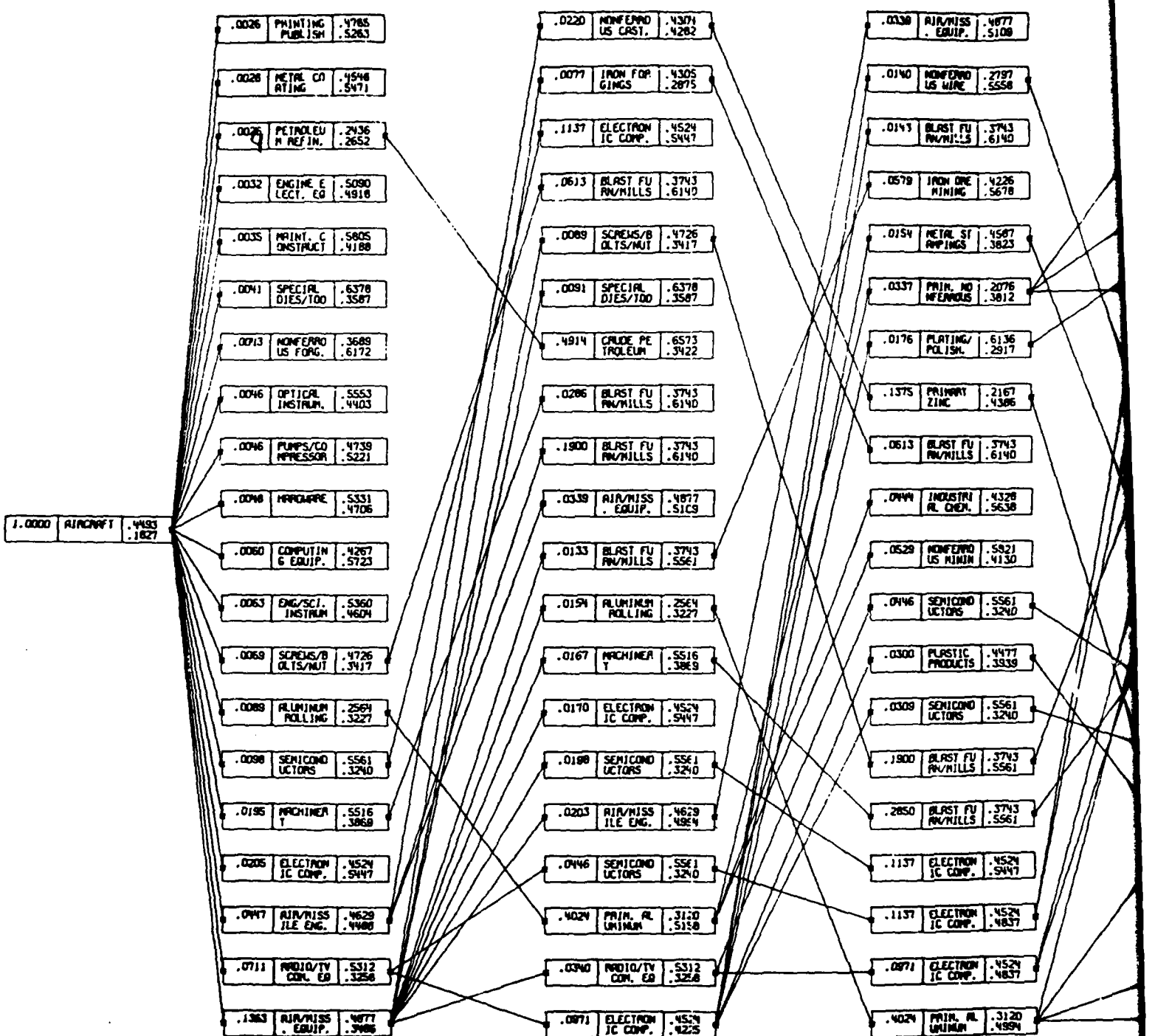
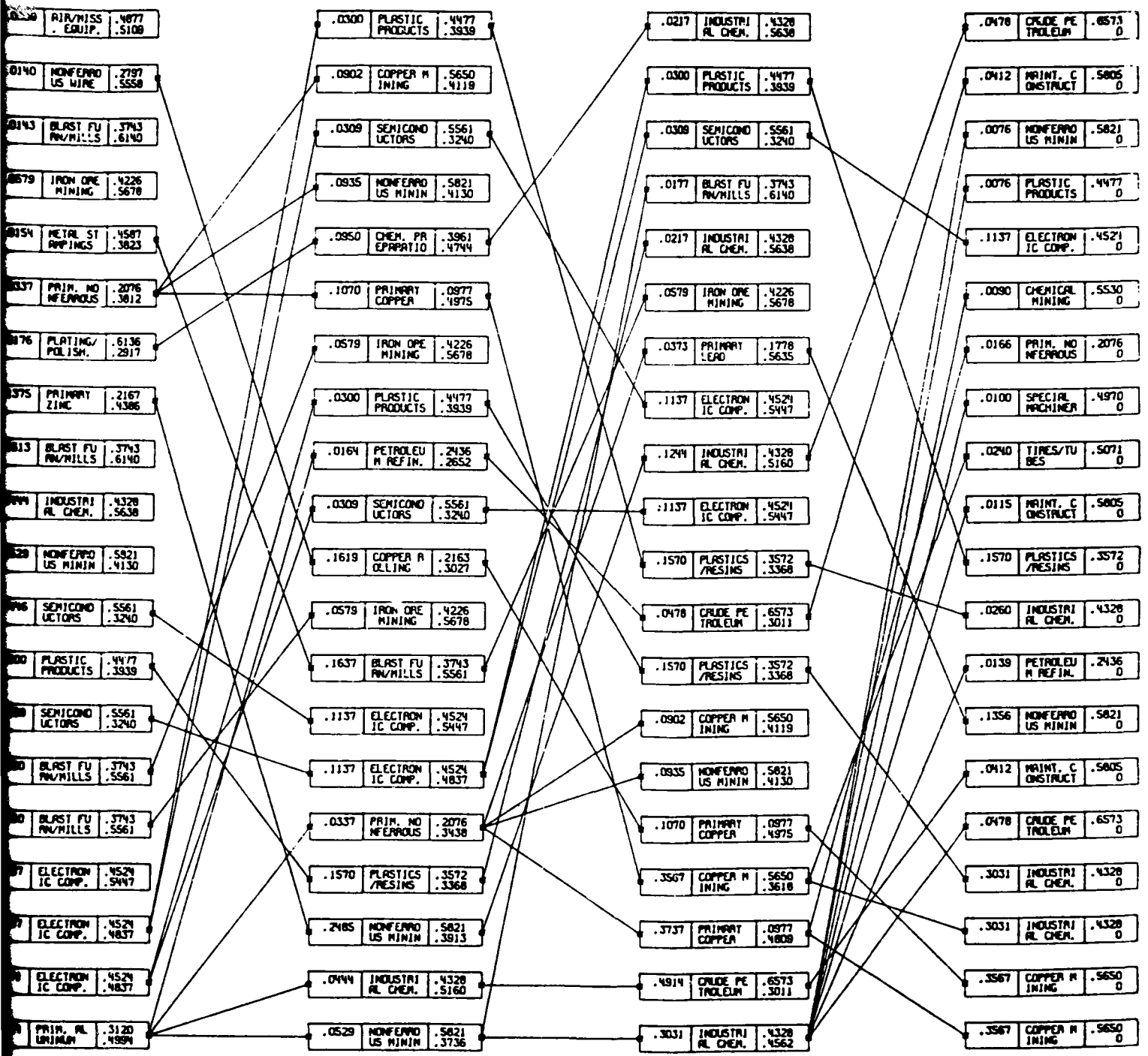


Figure B-1. CRITICAL PATH NETWORK FOR AIRC



ATH NETWORK FOR AIRCRAFT PRODUCTION

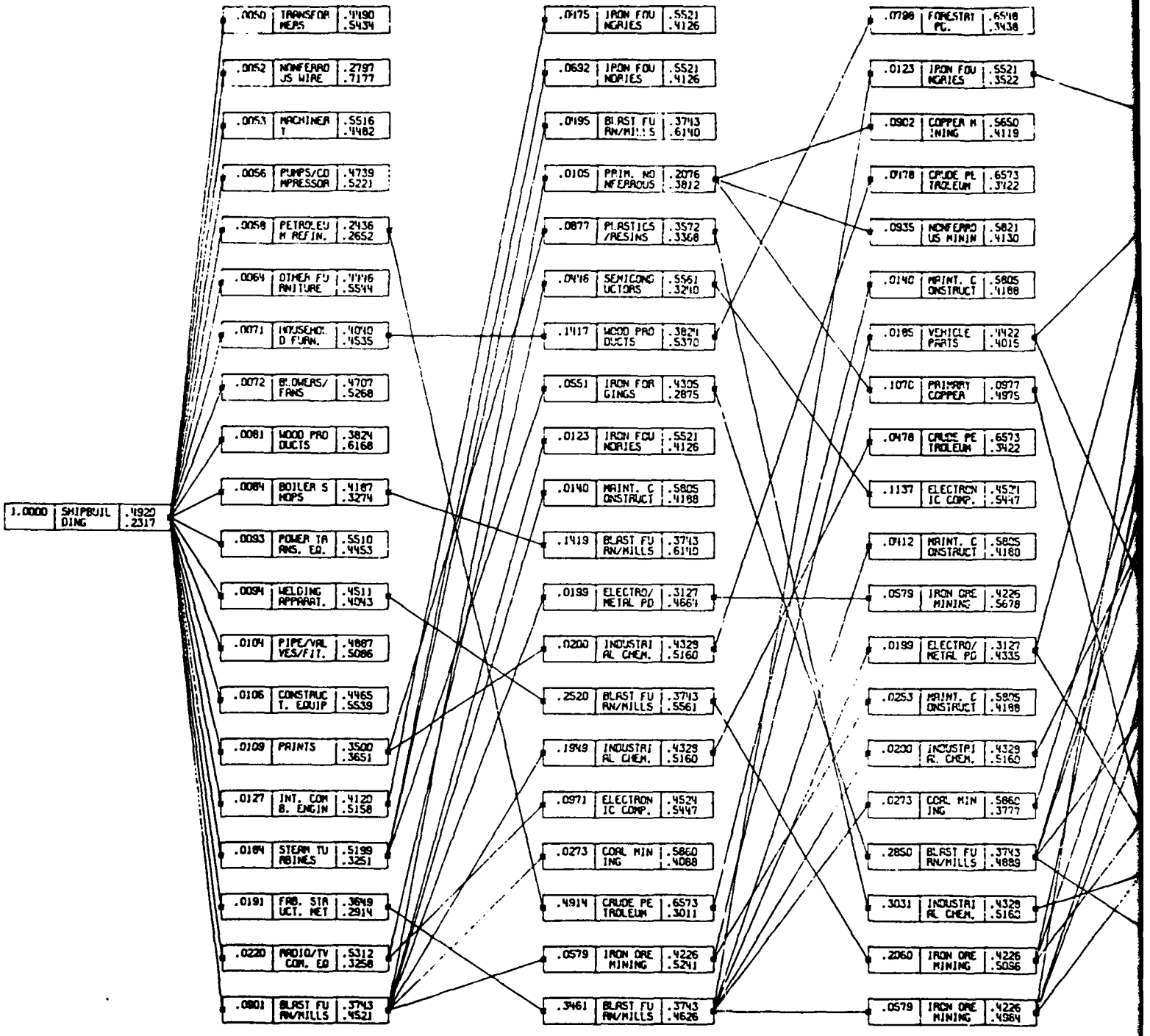
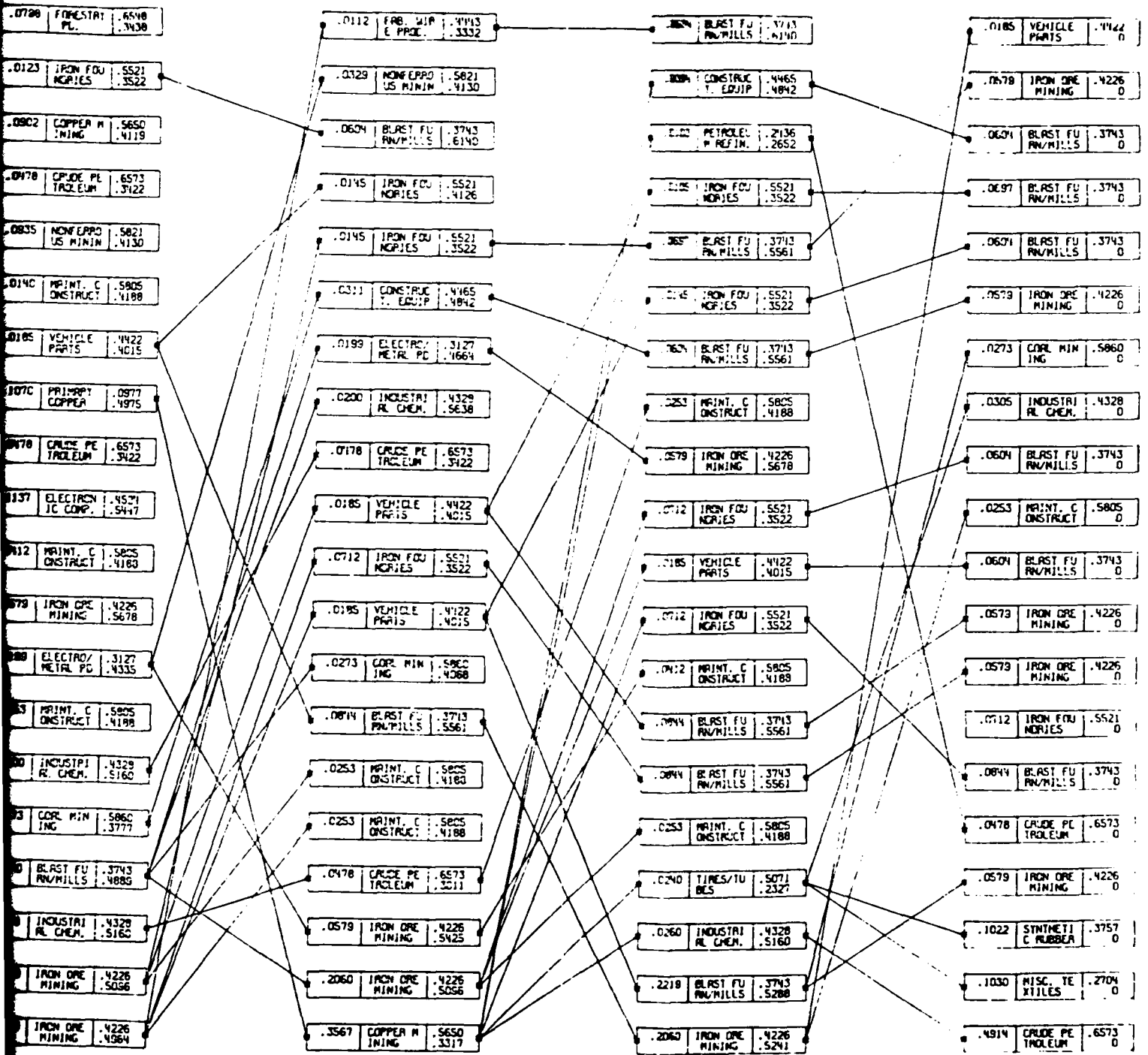


Figure B-2. CRITICAL PATH NETWORK FOR SH



PATH NETWORK FOR SHIP PRODUCTION

R-5/R-6

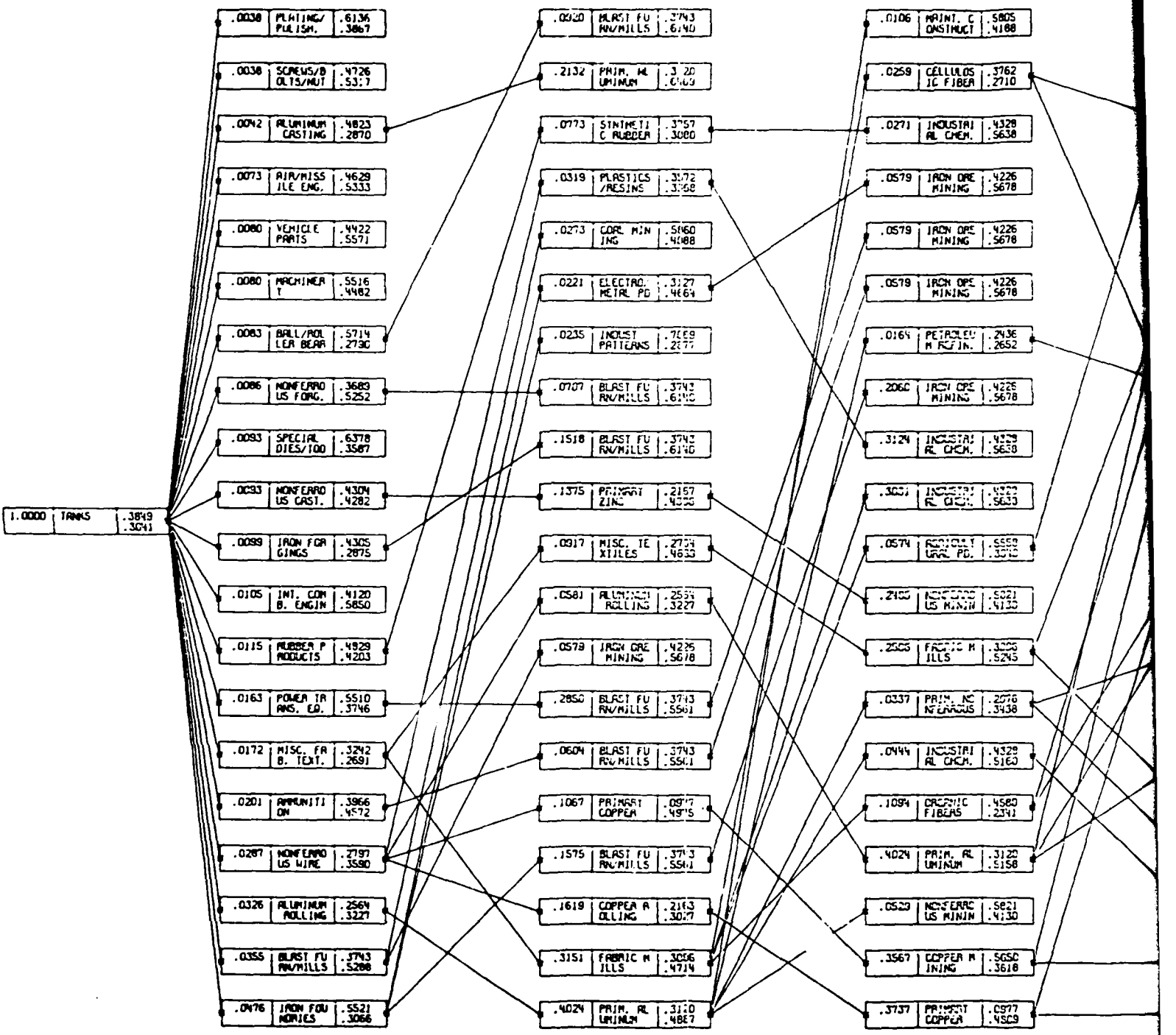
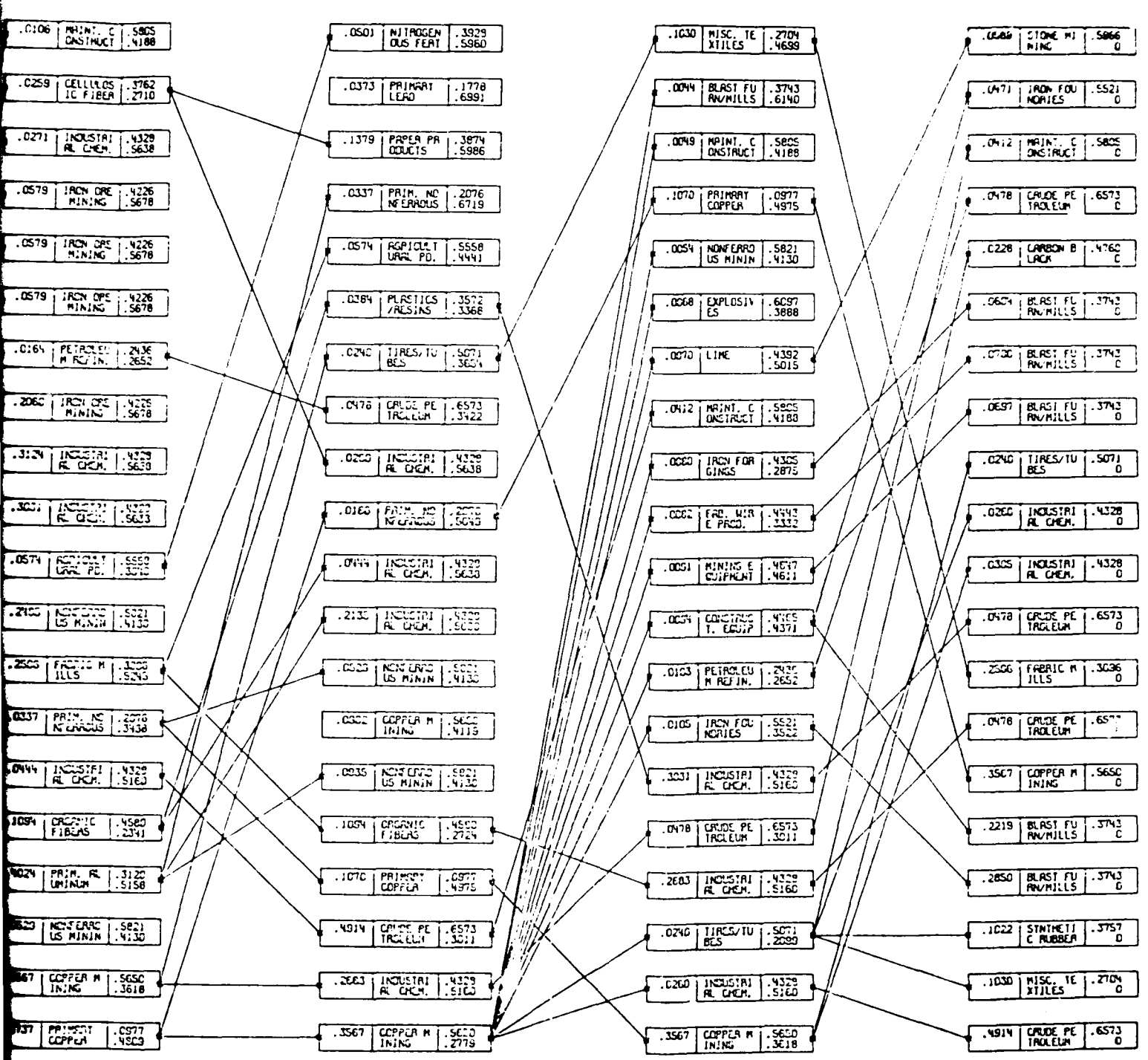


Figure B-3. CRITICAL PATH NETWORK FOR TANK



L PATH NETWORK FOR TANK PRODUCTION

P-7/H-9

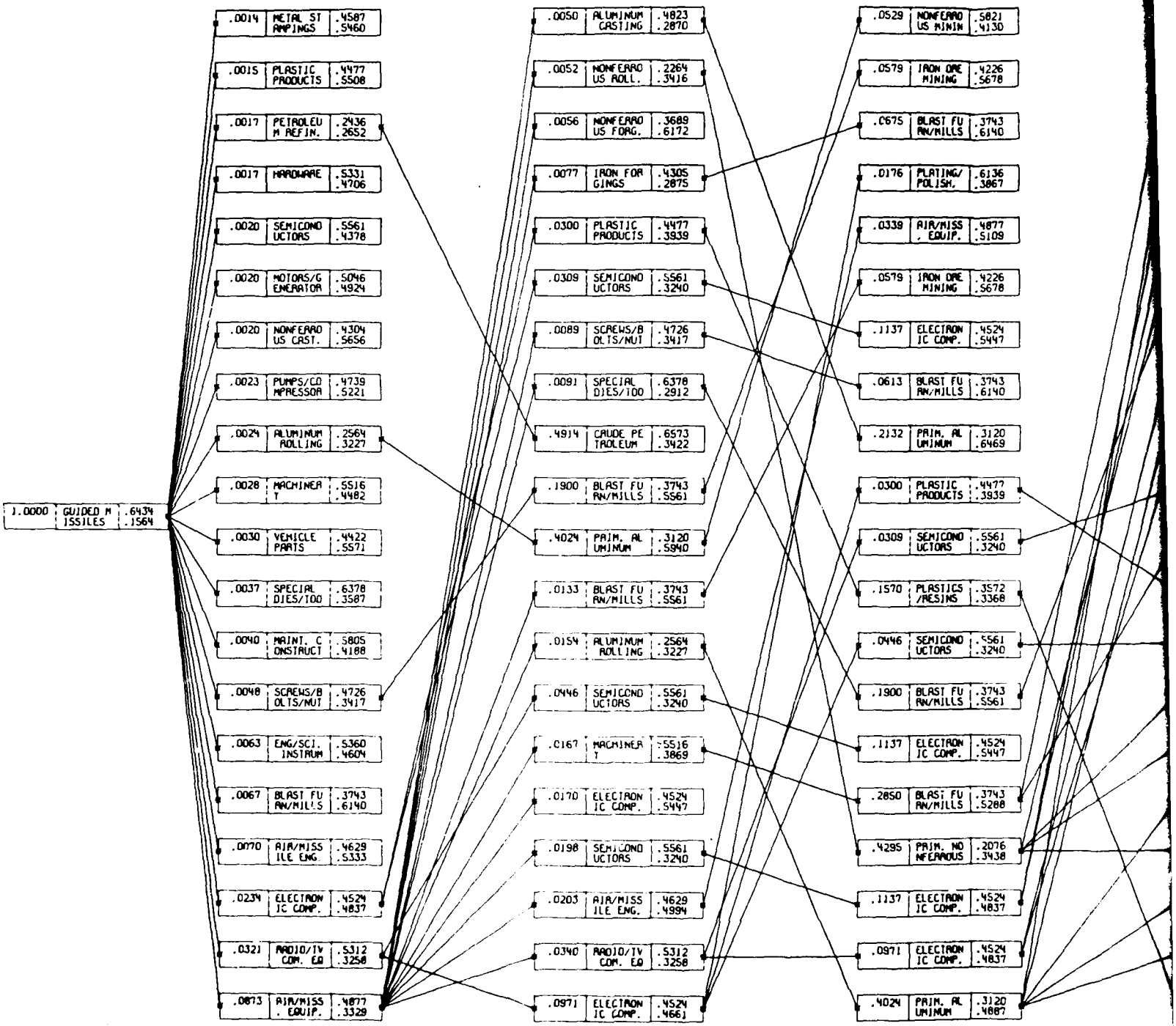
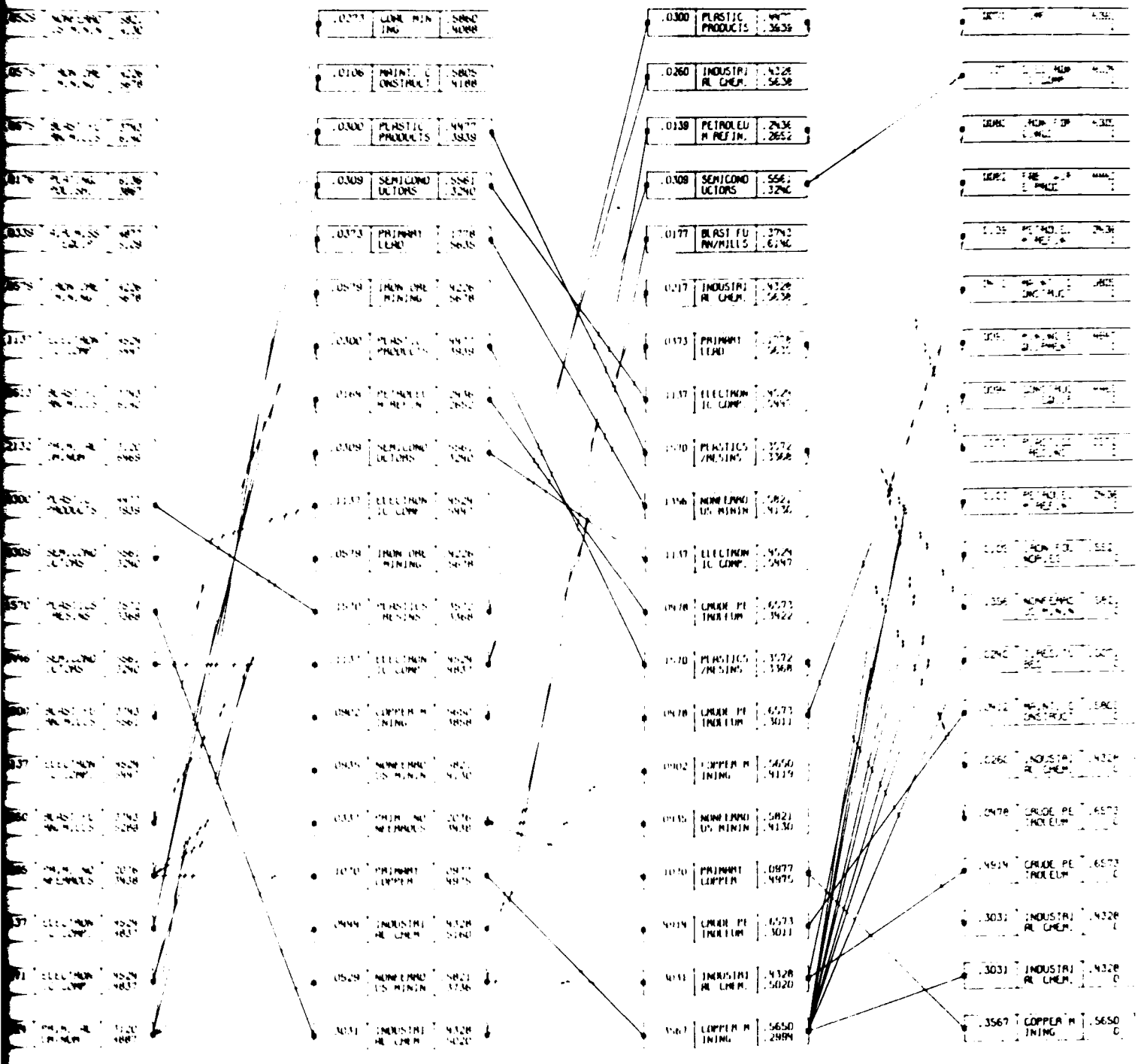


Figure B-4. CRITICAL PATH NETWORK FOR GUIDED MISSI


.0300 PLASTIC PRODUCTS
.0260 INDUSTRI AL CHEM.
.0139 PETROLEU M REFIN.
.0309 SEMICOND UCTORS
.0177 BLAST FU RN/MILLS
.0217 INDUSTRI AL CHEM.
.0373 PRIMARY LEAD
.0137 ELECTRON IC COMP.
.0300 PLASTICS /RESINS
.0196 NONFERRO US MININ
.0137 ELECTRON IC COMP.
.0078 CRUDE PE TROLEUM
.0300 PLASTICS /RESINS
.0078 CRUDE PE TROLEUM
.0102 COPPER M INING
.0196 NONFERRO US MININ
.0070 PRIMARY COPPER
.0039 CRUDE PE TROLEUM
.0031 INDUSTRI AL CHEM.
.0067 COPPER M INING
.0373 LEAD MIN ING
.0106 MAINT. C ONSTRUCT
.0300 PLASTIC PRODUCTS
.0309 SEMICOND UCTORS
.0373 PRIMARY LEAD
.0579 IRON ORE MINING
.0300 PLASTIC PRODUCTS
.0139 PETROLEU M REFIN.
.0309 SEMICOND UCTORS
.0137 ELECTRON IC COMP.
.0579 IRON ORE MINING
.0300 PLASTICS /RESINS
.0137 ELECTRON IC COMP.
.0102 COPPER M INING
.0196 NONFERRO US MININ
.0177 BLAST FU RN/MILLS
.0070 PRIMARY COPPER
.0039 CRUDE PE TROLEUM
.0031 INDUSTRI AL CHEM.
.0529 NONFERRO US MININ
.0031 INDUSTRI AL CHEM.
.0260 INDUSTRI AL CHEM.
.0078 CRUDE PE TROLEUM
.0031 INDUSTRI AL CHEM.
.3567 COPPER M INING

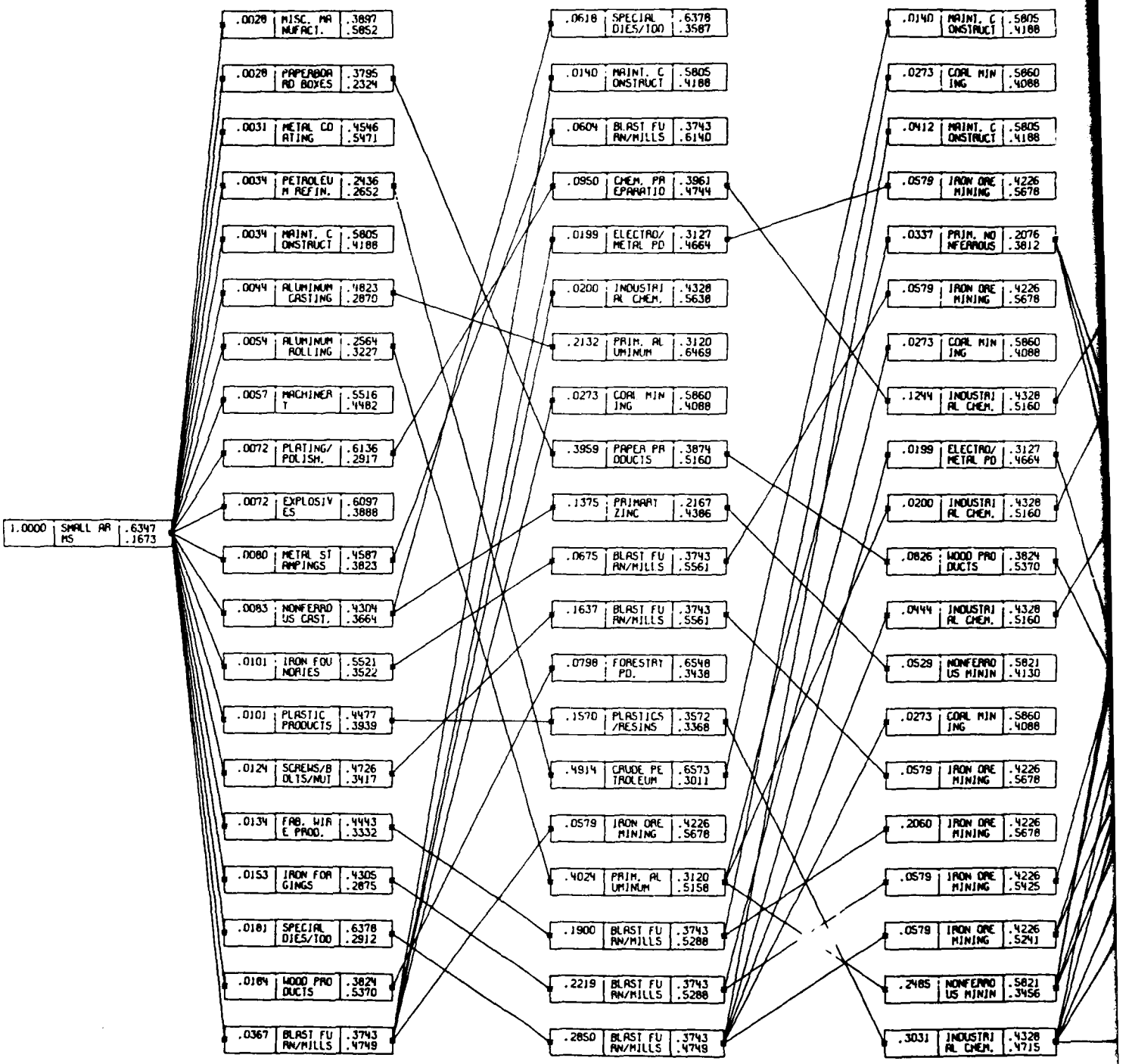
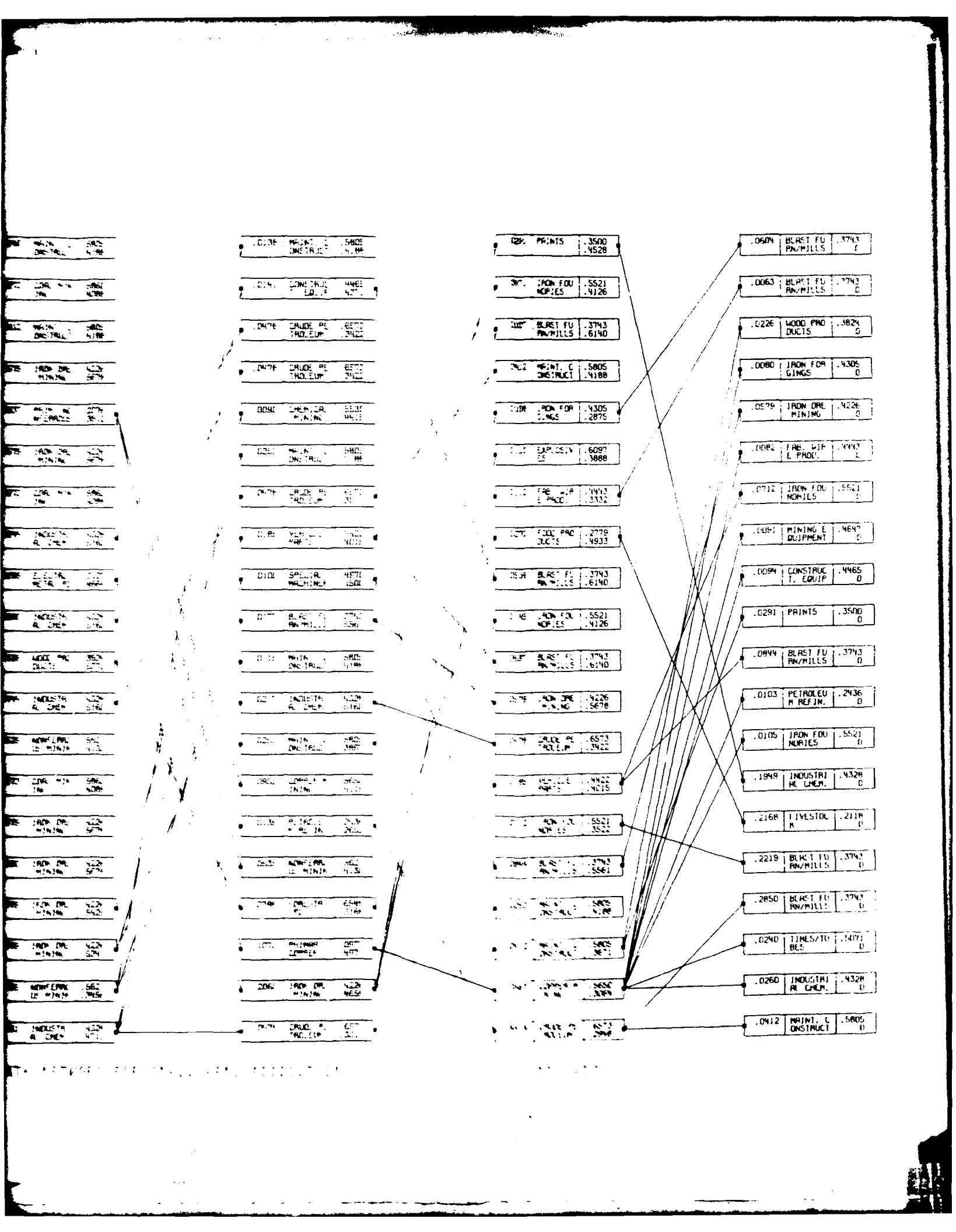


Figure B-5. CRITICAL PATH NETWORK FOR S


PRINTS .3500 .4528
IRON FOU NDRIES .5521 .4126
BLAST FU RN/MILLS .3743 .6140
MAINT. C ONSTRUCT .5805 .4188
IRON ORE MINING .4305 .2875
EXPLOSIV ES .6097 .3888
FAB. MIP E PROD. .3993 .3332
FOOD PRO DUCTS .2779 .4933
BLAST FU RN/MILLS .3743 .6140
IRON FOU NDRIES .5521 .4126
BLAST FU RN/MILLS .3743 .6140
IRON ORE MINING .4226 .5678
CRUDE PE TROLEUM .6573 .3422
.0604 BLAST FU RN/MILLS .3743 0
.0063 BLAST FU RN/MILLS .3743 0
.0226 WOOD PRO DUCTS .3824 0
.0080 IRON FOU GINGS .4305 0
.0579 IRON ORE MINING .4226 0
.0082 FAB. MIP E PROD. .3993 0
.0712 IRON FOU NDRIES .5521 0
.0095 MINING E QUIPMENT .4642 0
.0094 CONSTRUC T. EQUIP .4465 0
.0291 PAINTS .3500 0
.0844 BLAST FU RN/MILLS .3743 0
.0103 PETROLEU M REFIN. .2436 0
.0105 IRON FOU NDRIES .5521 0
.1949 INDUSTRI AL CHEM. .4328 0
.2168 LIVESTOC K .2118 0
.2219 BLAST FU RN/MILLS .3743 0
.2850 BLAST FU RN/MILLS .3743 0
.0240 TIMES/TO BES .5071 0
.0260 INDUSTRI AL CHEM. .4328 0
.0412 MAINT. C ONSTRUCT .5805 0

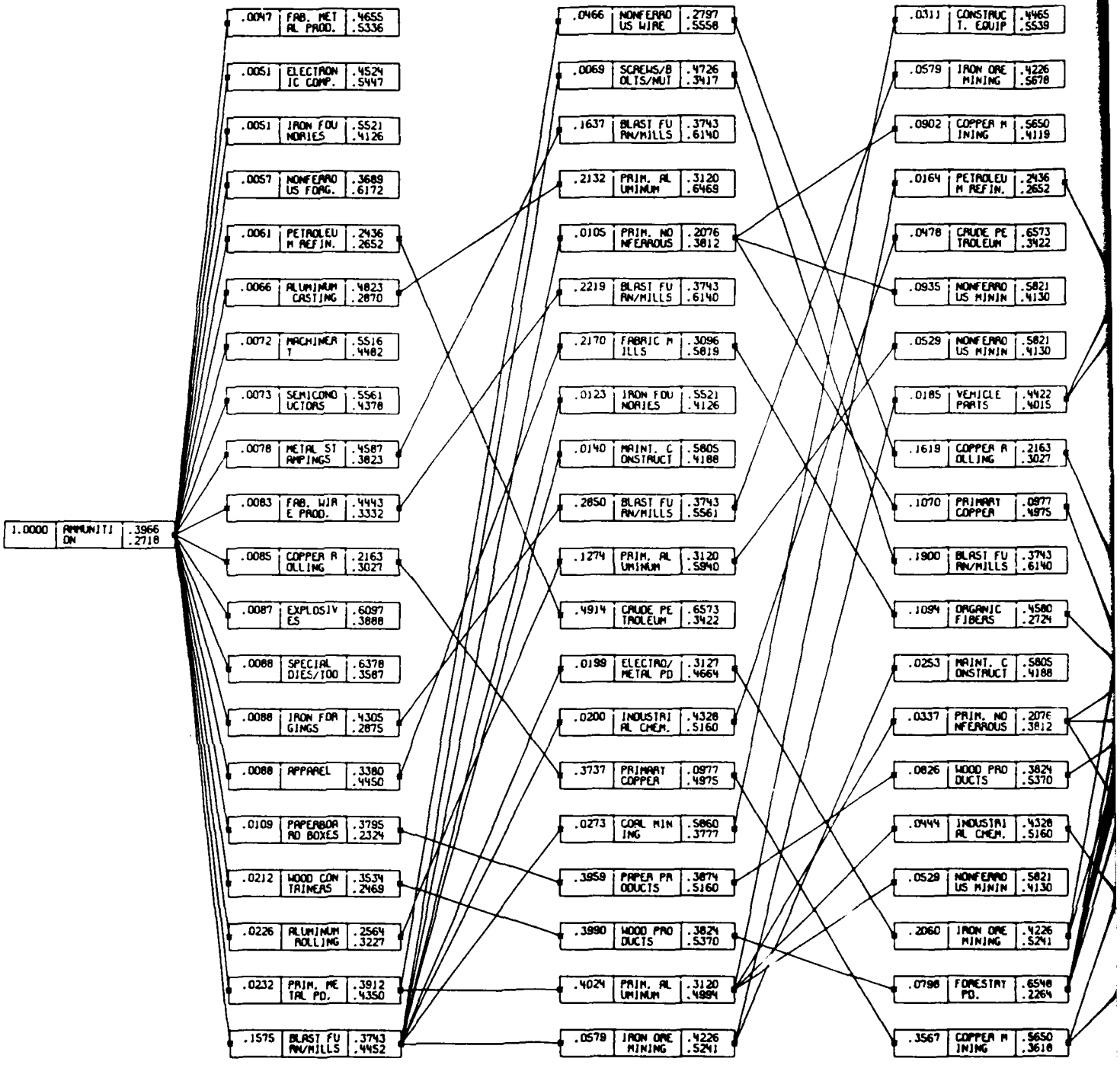
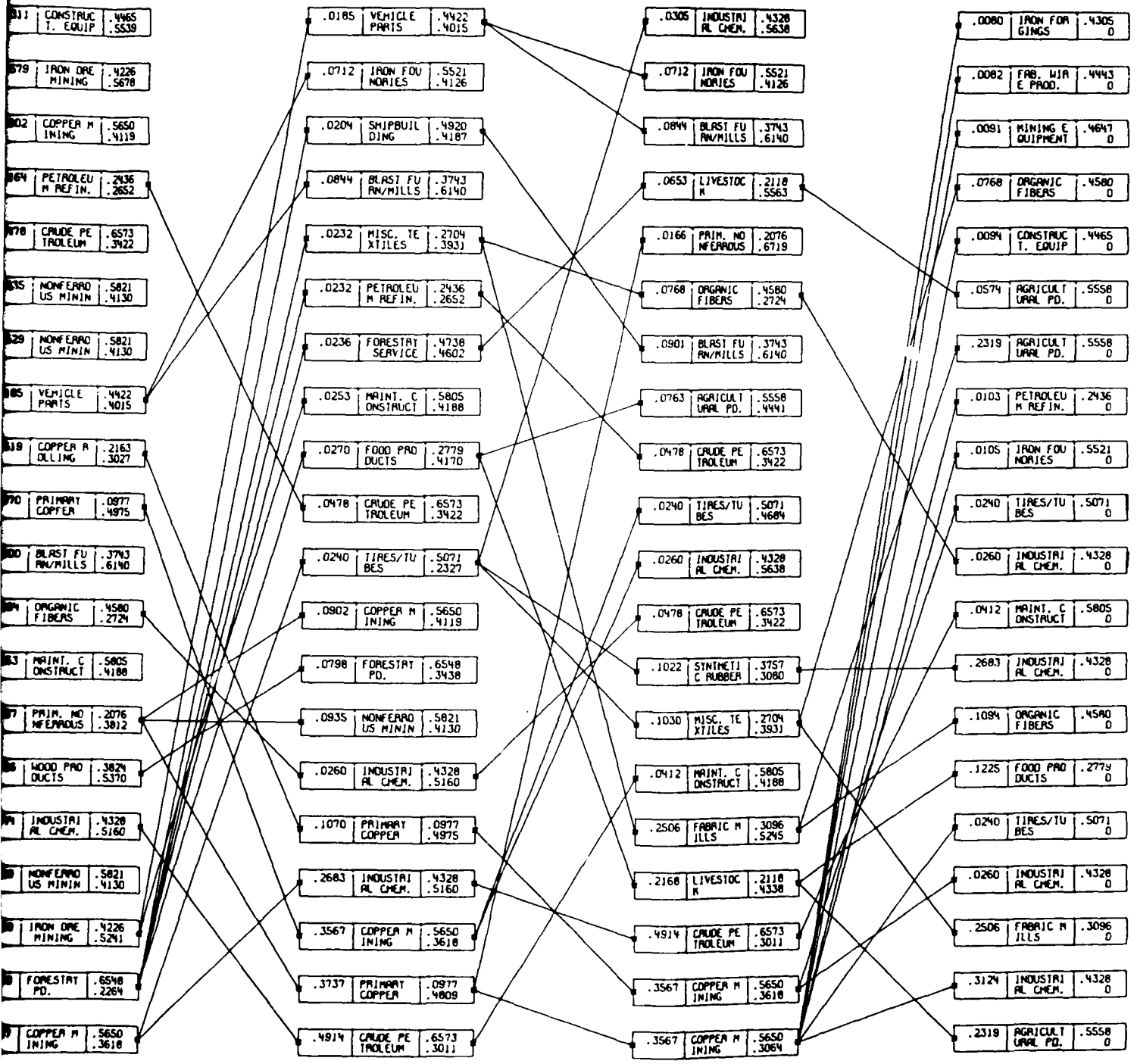


Figure B-6. CRITICAL PATH NETWORK FOR



TH NETWORK FOR AMMUNITION PRODUCTION

B-12/B-14

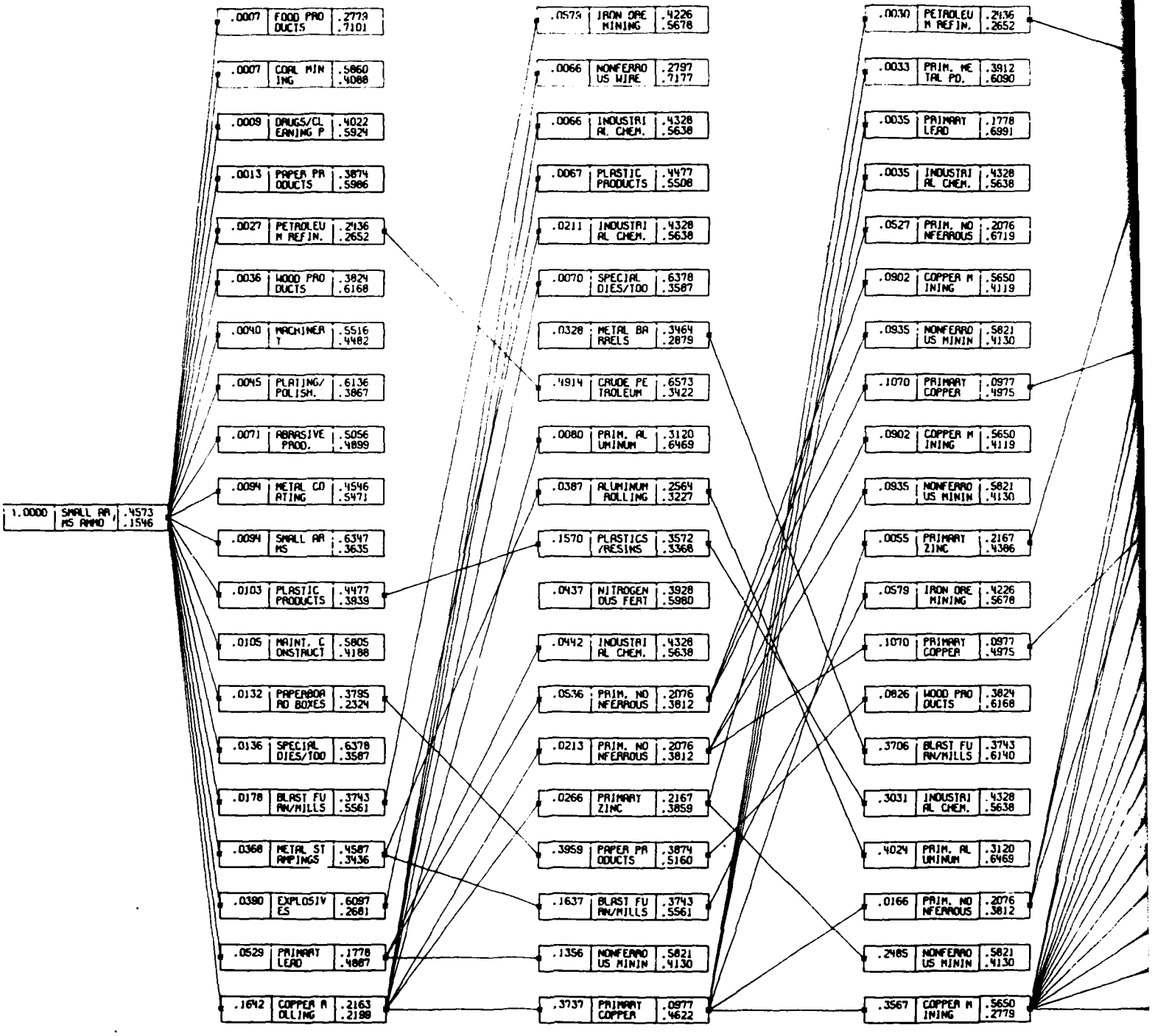
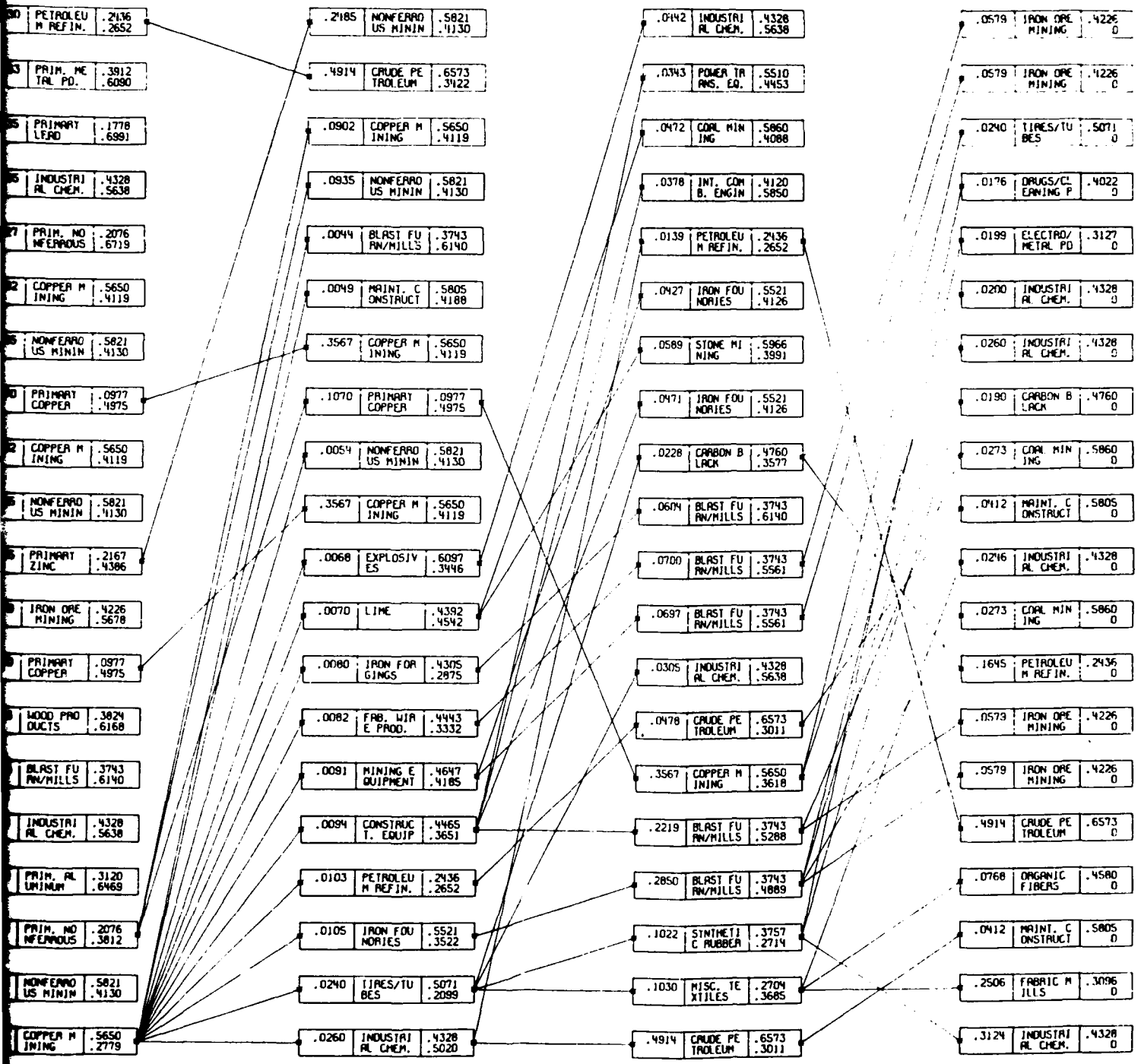


Figure B-7. CRITICAL PATH NETWORK FOR THE PI
SMALL ARMS AMMUNITION



TH NETWORK FOR THE PRODUCTION OF AMMUNITION

B-15/B-16

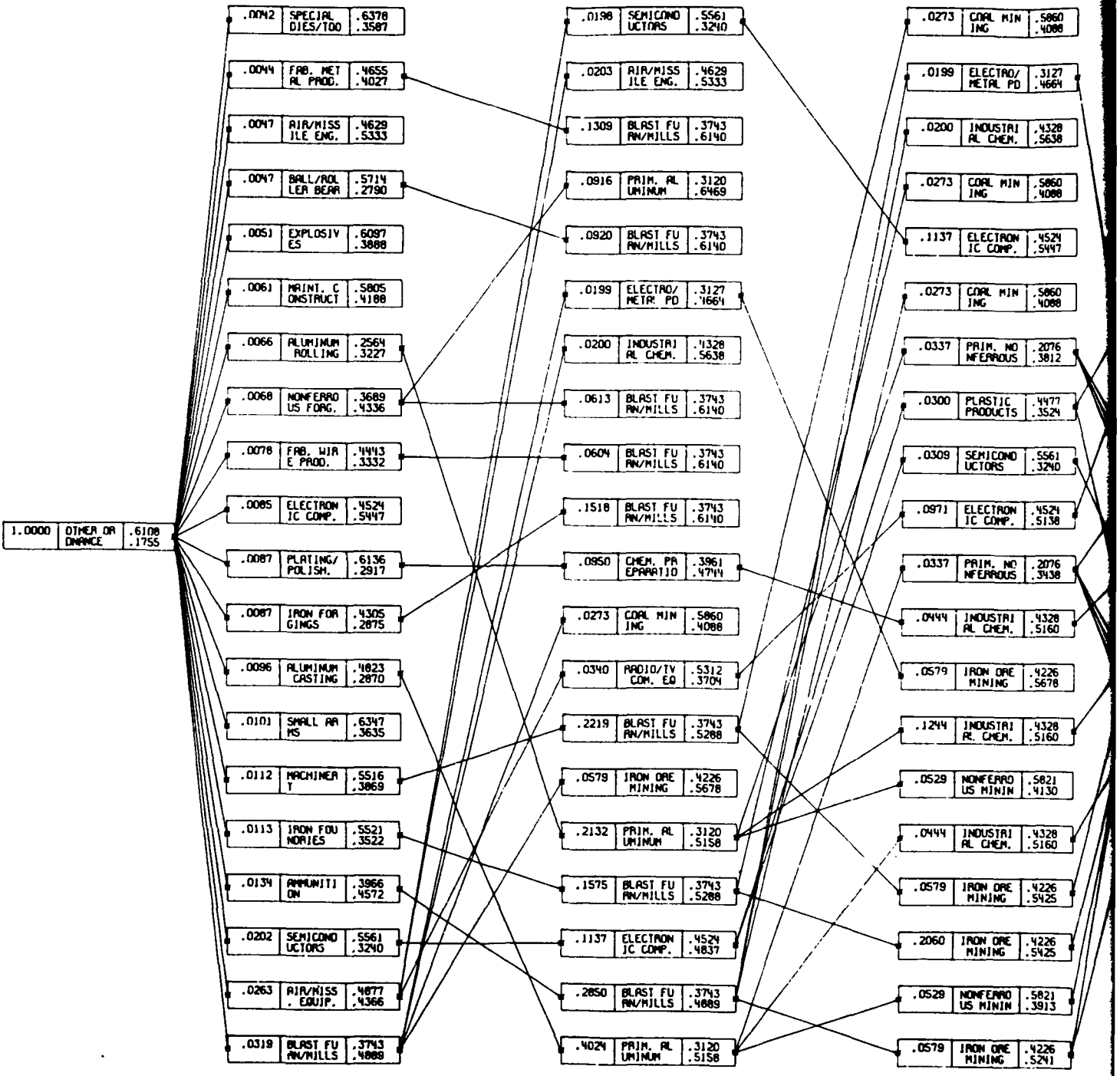
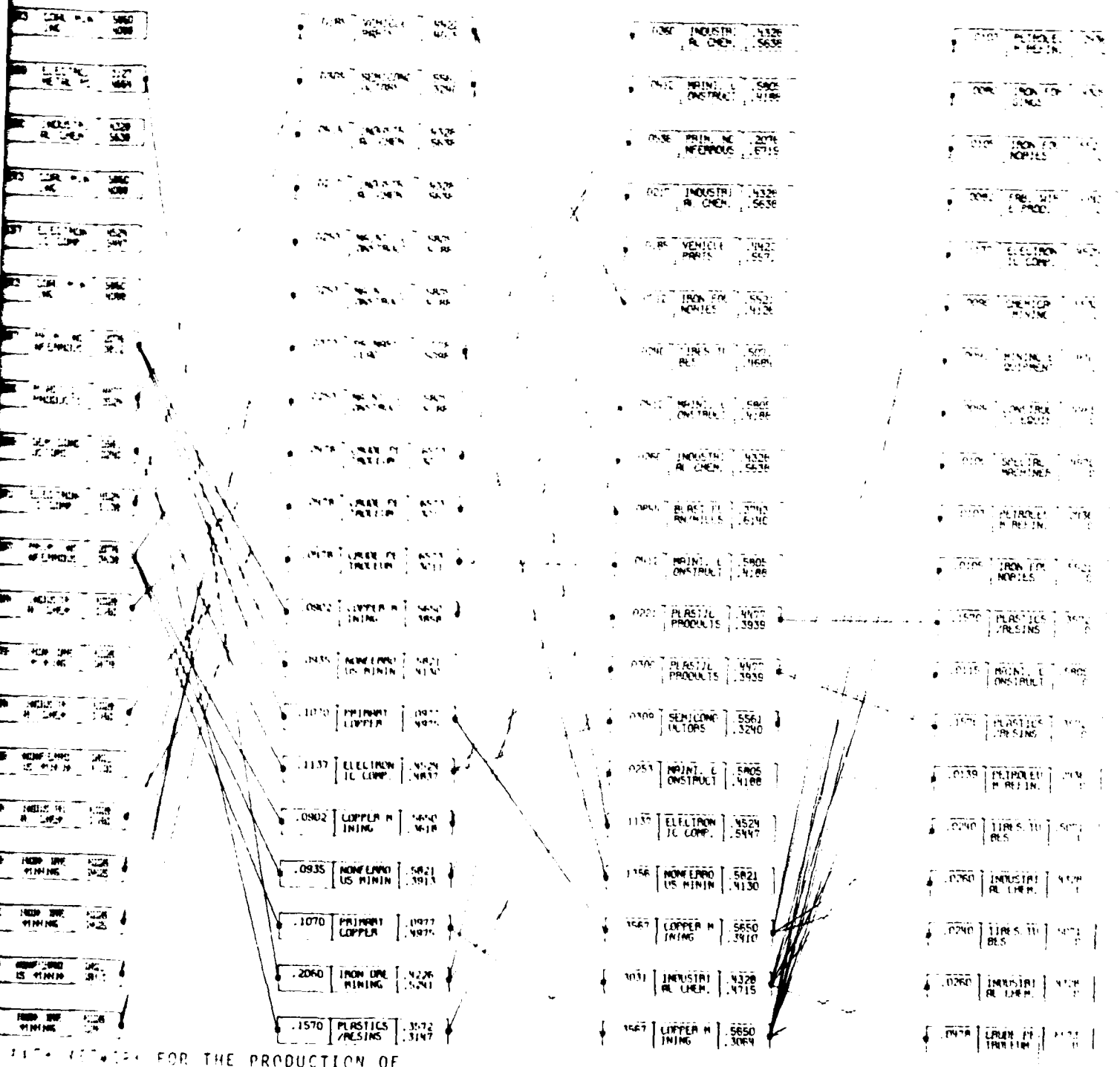


Figure B-8. CRITICAL PATH NETWORK OTHER ORDNANCE



FOR THE PRODUCTION OF

APPENDIX C

ALTERNATIVE TIME-PHASING FOR SELECTED INDUSTRIAL AND DEFENSE COMMODITIES

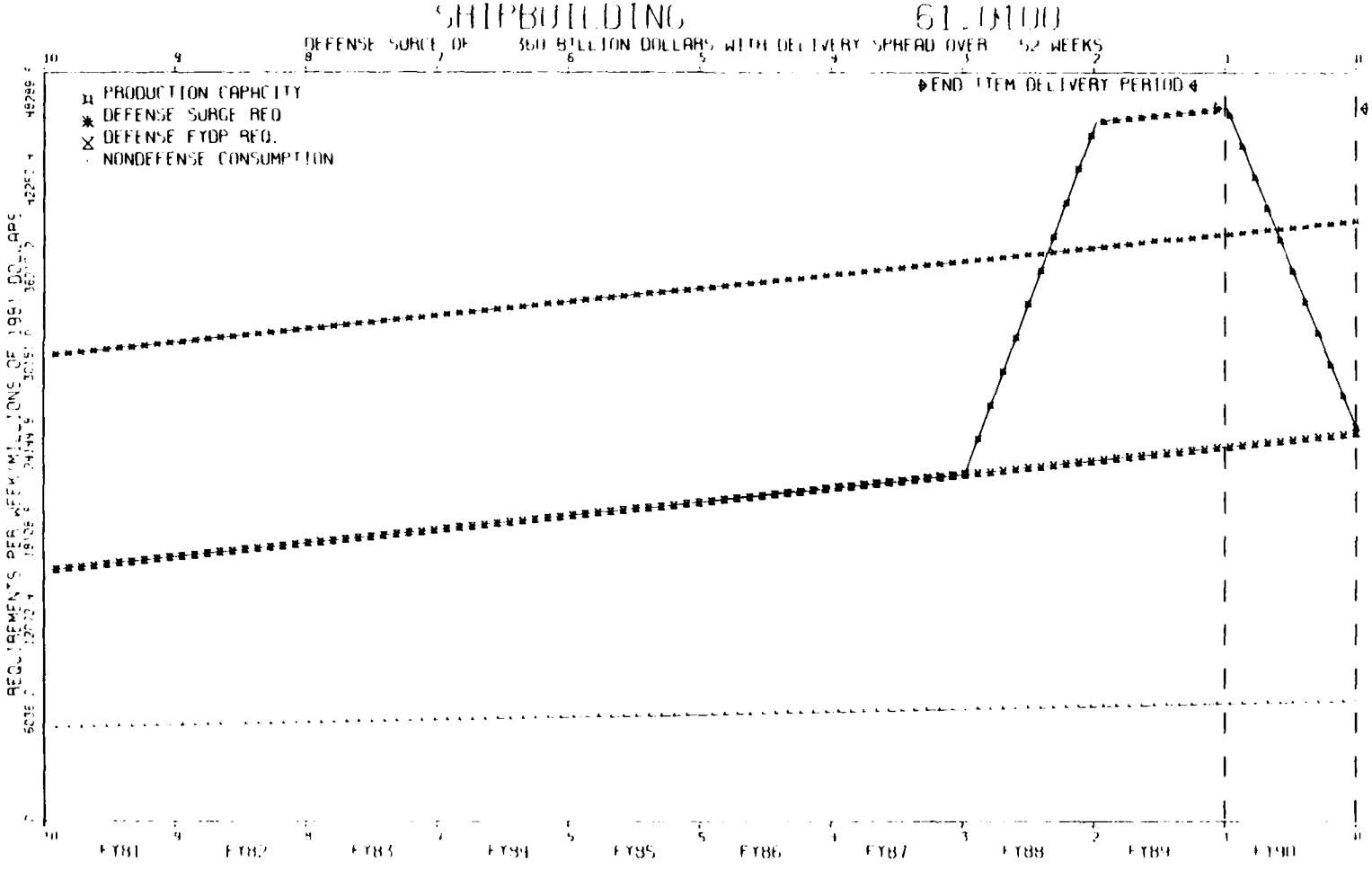
ALTERNATIVE TIME-PHASING FOR SELECTED INDUSTRIAL AND DEFENSE COMMODITIES

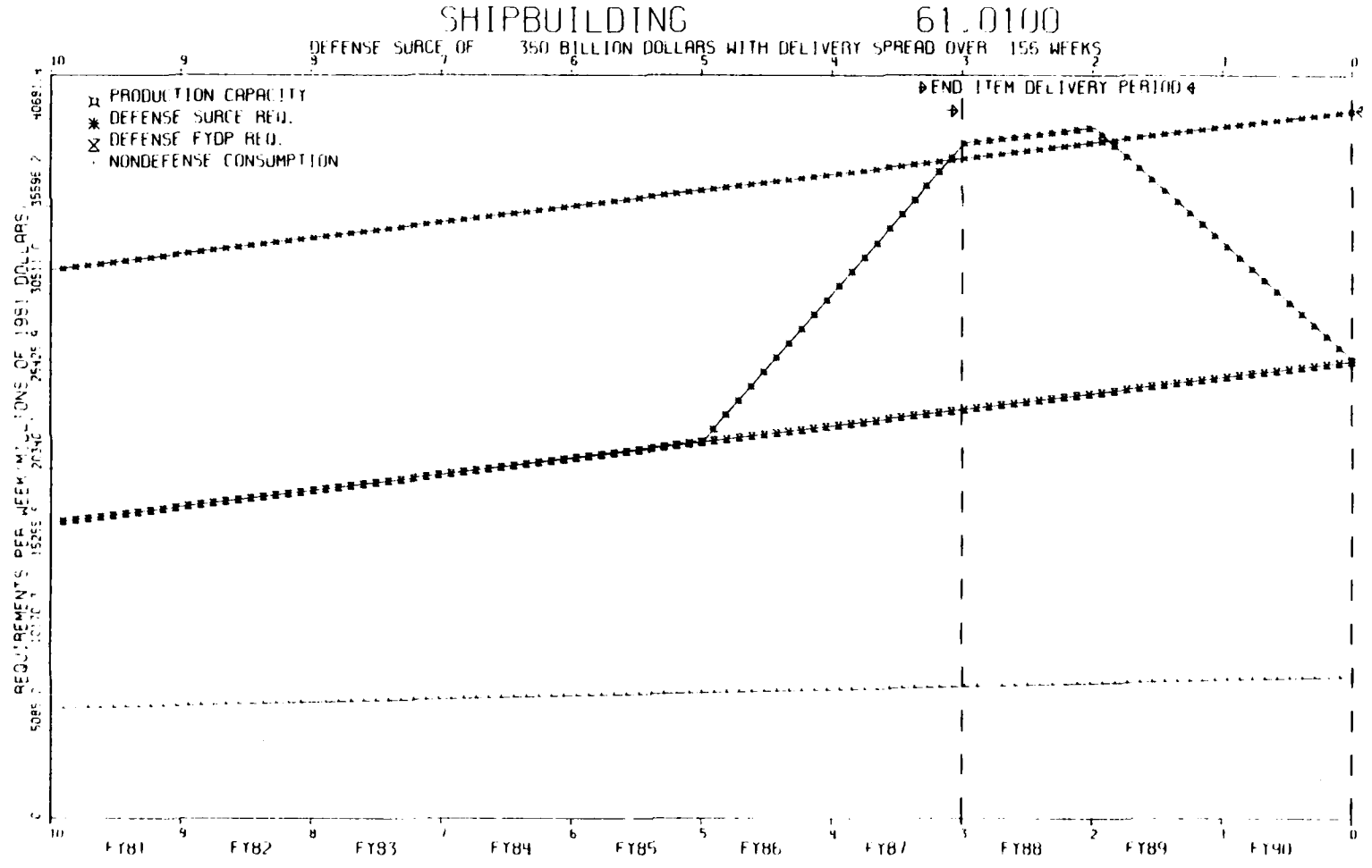
For 24 industrial and defense commodities, this Appendix displays time-phased requirements for a 50 percent surge in defense spending with end-item deliveries spread over one year, three years, and five years. Also shown are requirements for a 200 percent surge in defense spending with end-item deliveries spread over five years. The 50 percent surge runs assume that defense spending is increased by 50 percent above FY 1986 levels for three years resulting in additional expenditures of $360 billion (1981 dollars). The 200 percent surge results in additional expenditures of $1,440 billion (1981 dollars) over five years.

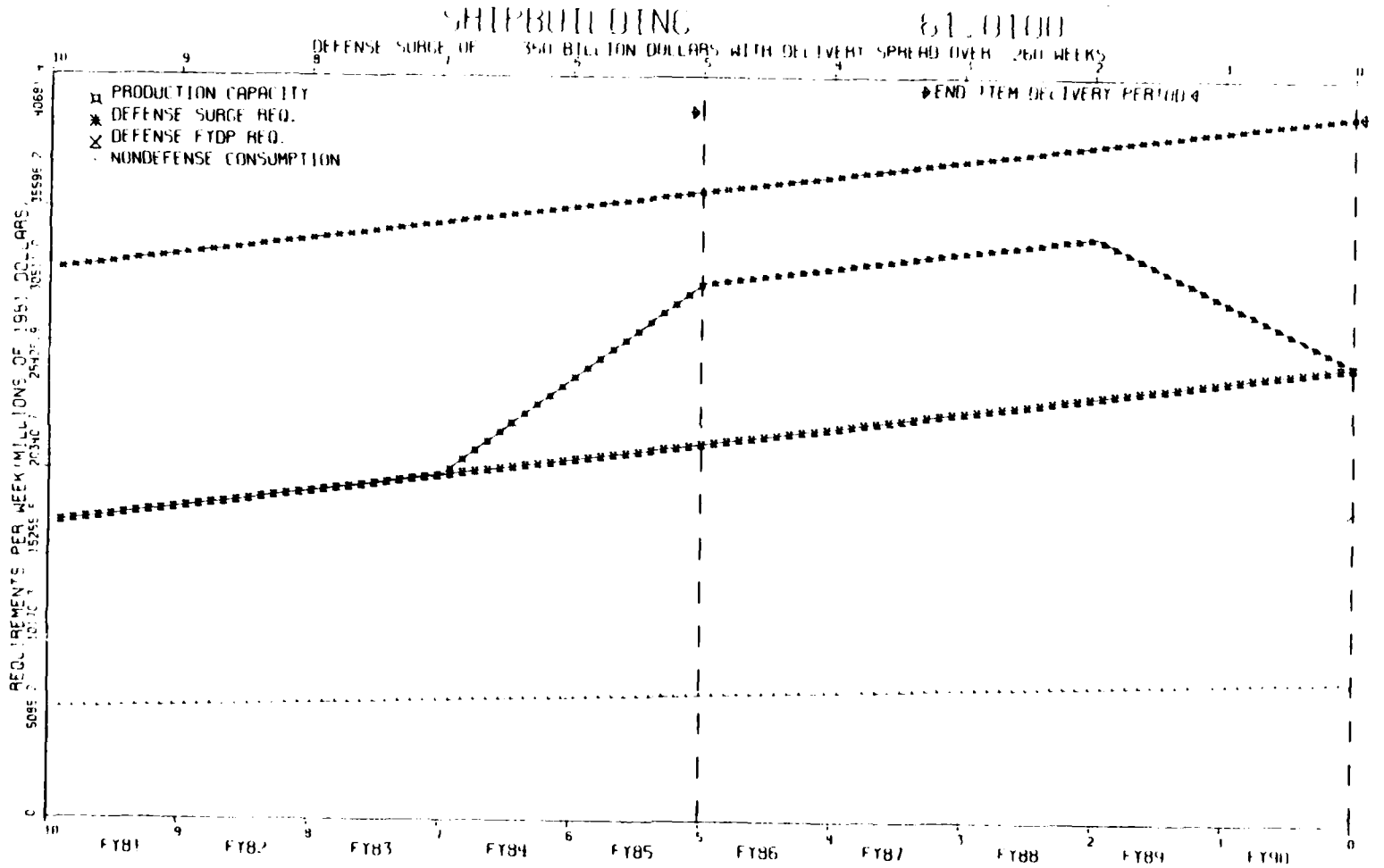
Table C-1 lists the 24 selected commodities. The selected commodities include those 13 where a 50 percent surge caused requirements to exceed estimated capacity. The remaining 11 commodities were selected to ensure at least one commodity from each major product grouping was included as well as additional commodities in the key areas of Military End Items and Primary Metal Manufacturing.

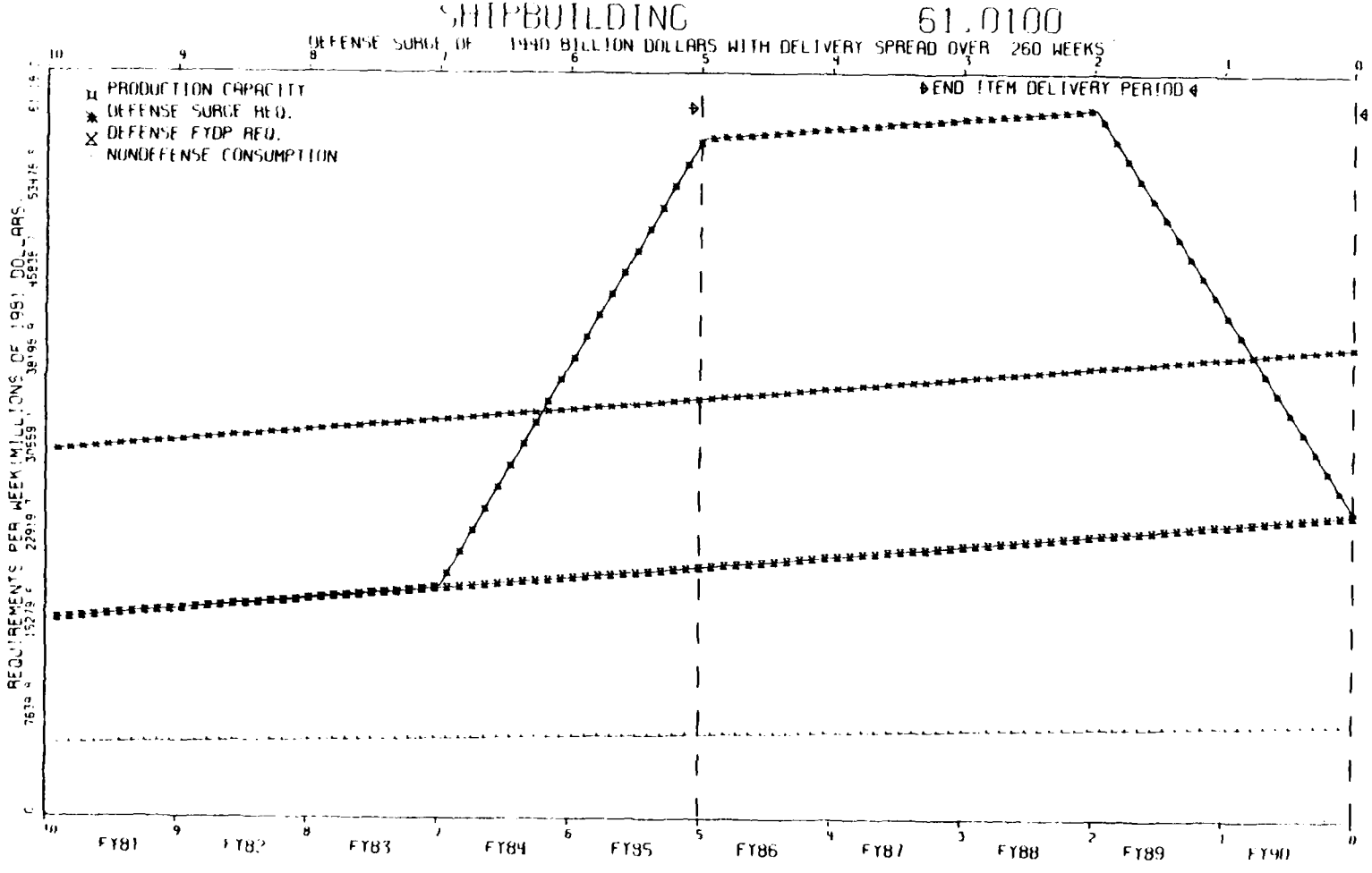
Table C-1. SELECTED INDUSTRIAL AND DEFENSE-ORIENTED COMMODITIES

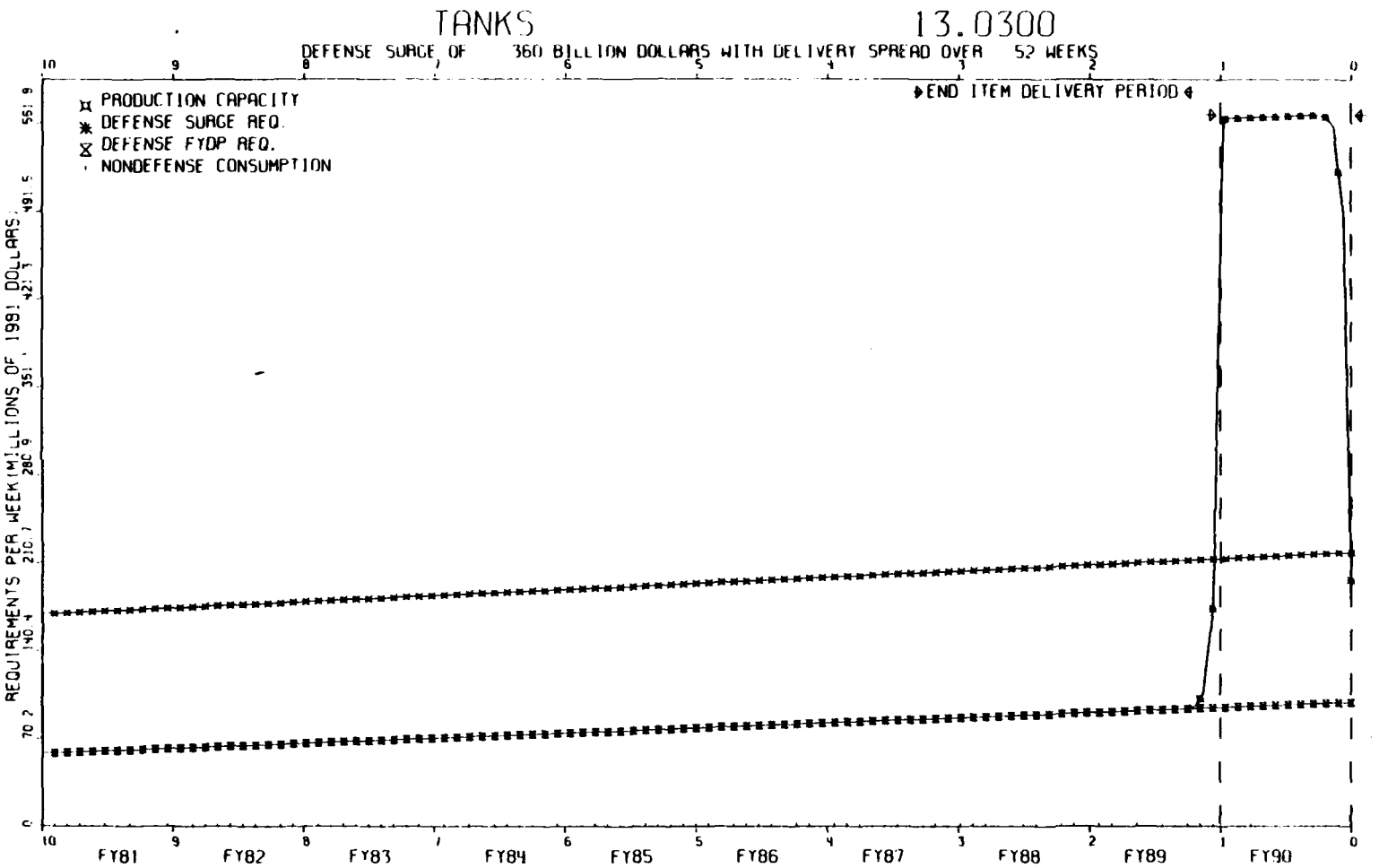
Seq. No.	ID. No.	Commodity Name
	Military End Items	
1	61.0100	Shipbuilding
2	13.0300	Tanks
3	13.0100	Guided Missiles
4	13.0200	Ammunition
5	13.0600	Small Arms Ammo
6	13.0700	Other Ordnance
	Transportation Equipment	
7	60.0200	Air/Missile Eng.
8	60.0400	Air/Miss. Equip.
	Machinery	
9	56.0400	Radio/TV Com. Eq.
10	57.0100	Electron Tubes
11	57.0200	Semiconductors
	Fabricated Metal Products	
12	42.0401	Plating/Polish
	Primary Metal Manufacturing	
13	37.0101	Blast Furn/Mills
14	37.0402	Prim. Metal Pd.
15	38.0100	Primary Copper
16	38.0200	Primary Lead
17	38.0300	Primary Zinc
18	38.0400	Prim. Aluminum
19	38.0800	Aluminum Rolling
20	38.1100	Aluminum Casting
21	38.1300	Nonferrous Cast.
22	38.1400	Nonferrous Forg.
	Other Manufacturing	
23	62.0100	Eng/Sci. Instrum.
24	27.0403	Explosives

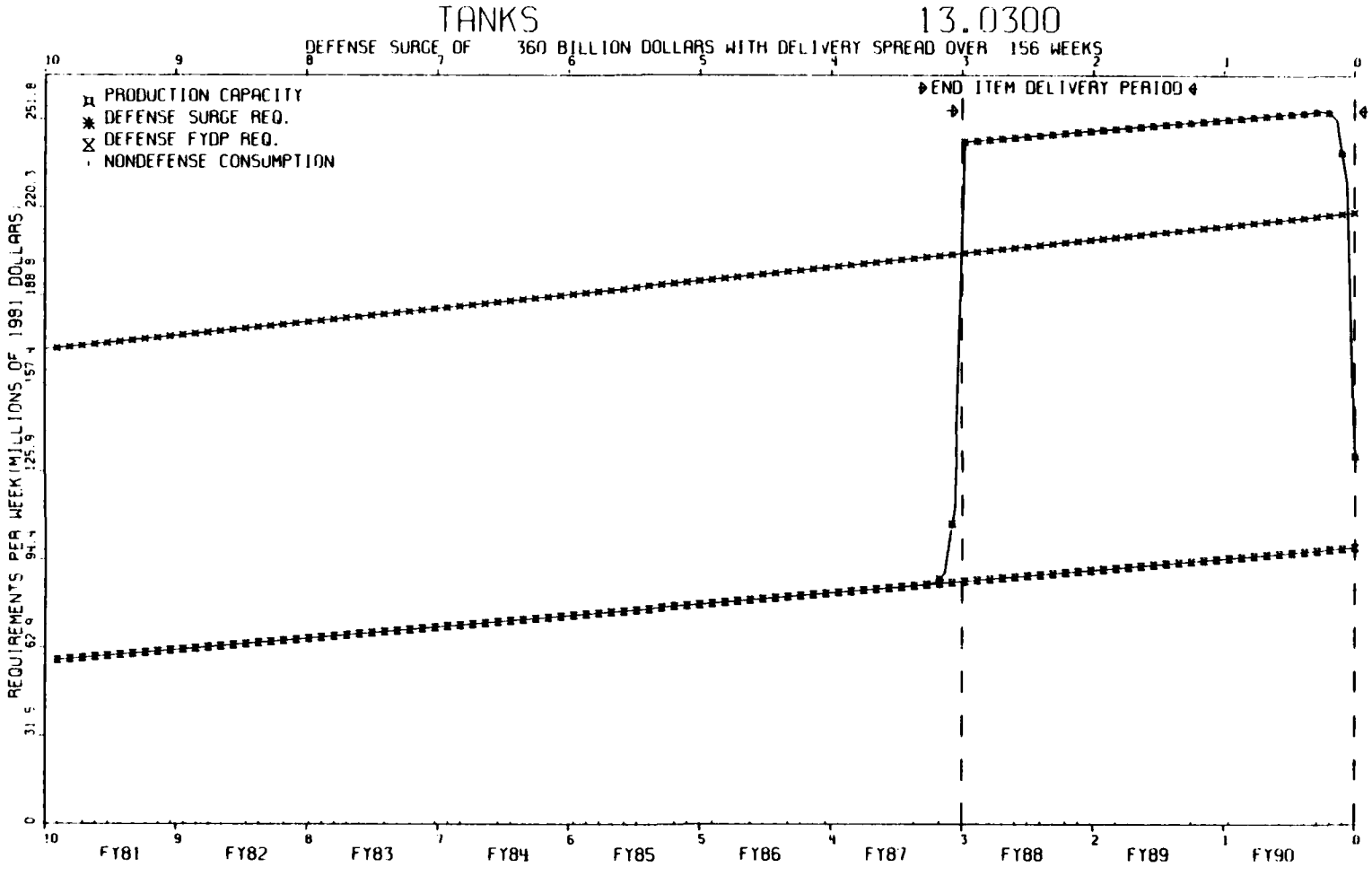

SHIPBUILDING
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

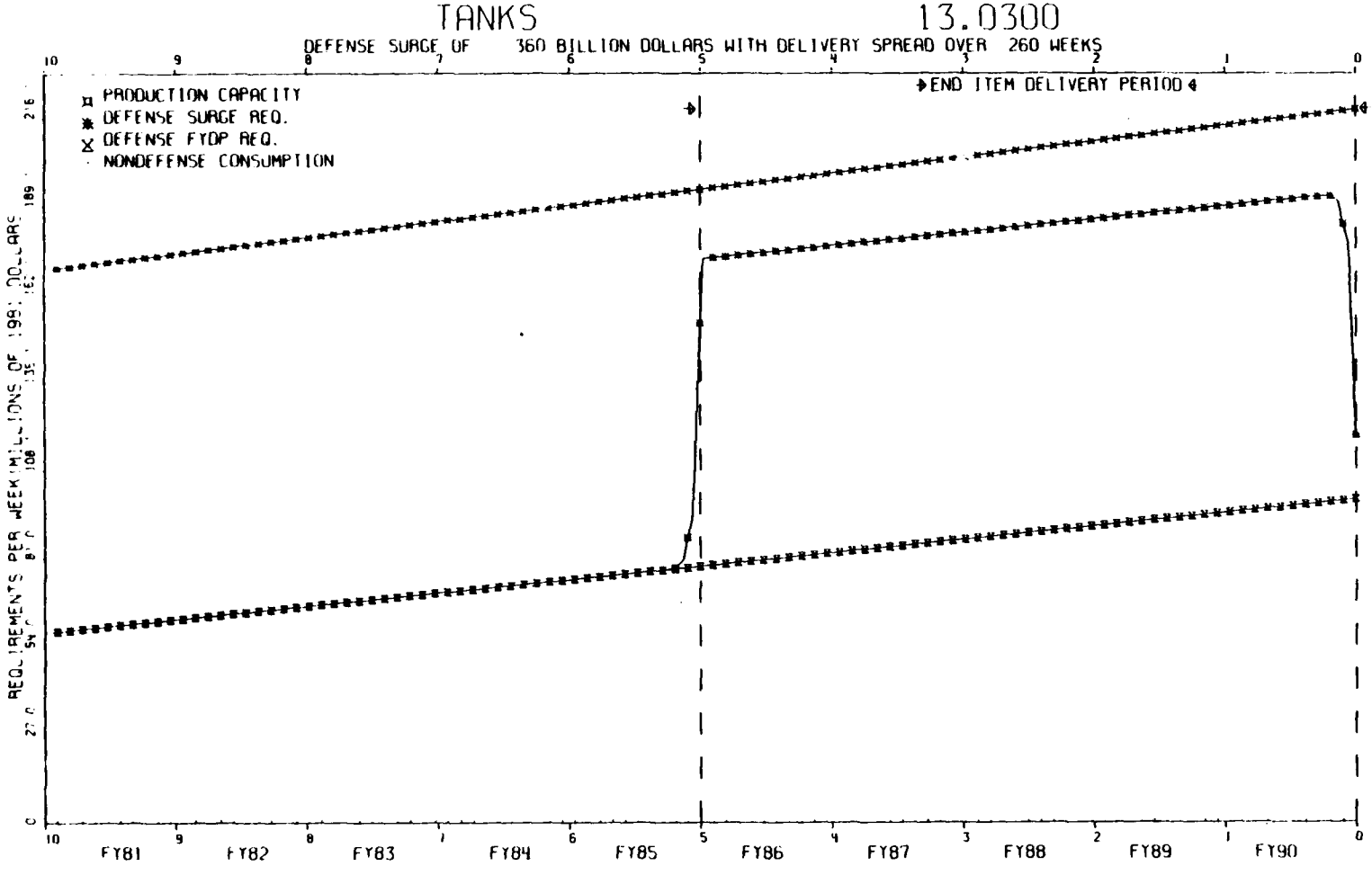

SHIPBUILDING 61.0100
DEFENSE SURGE OF 350 BILLION DOLLARS WITH DELIVERY SPREAD OVER 155 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK IN BILLIONS OF 1951 DOLLARS
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

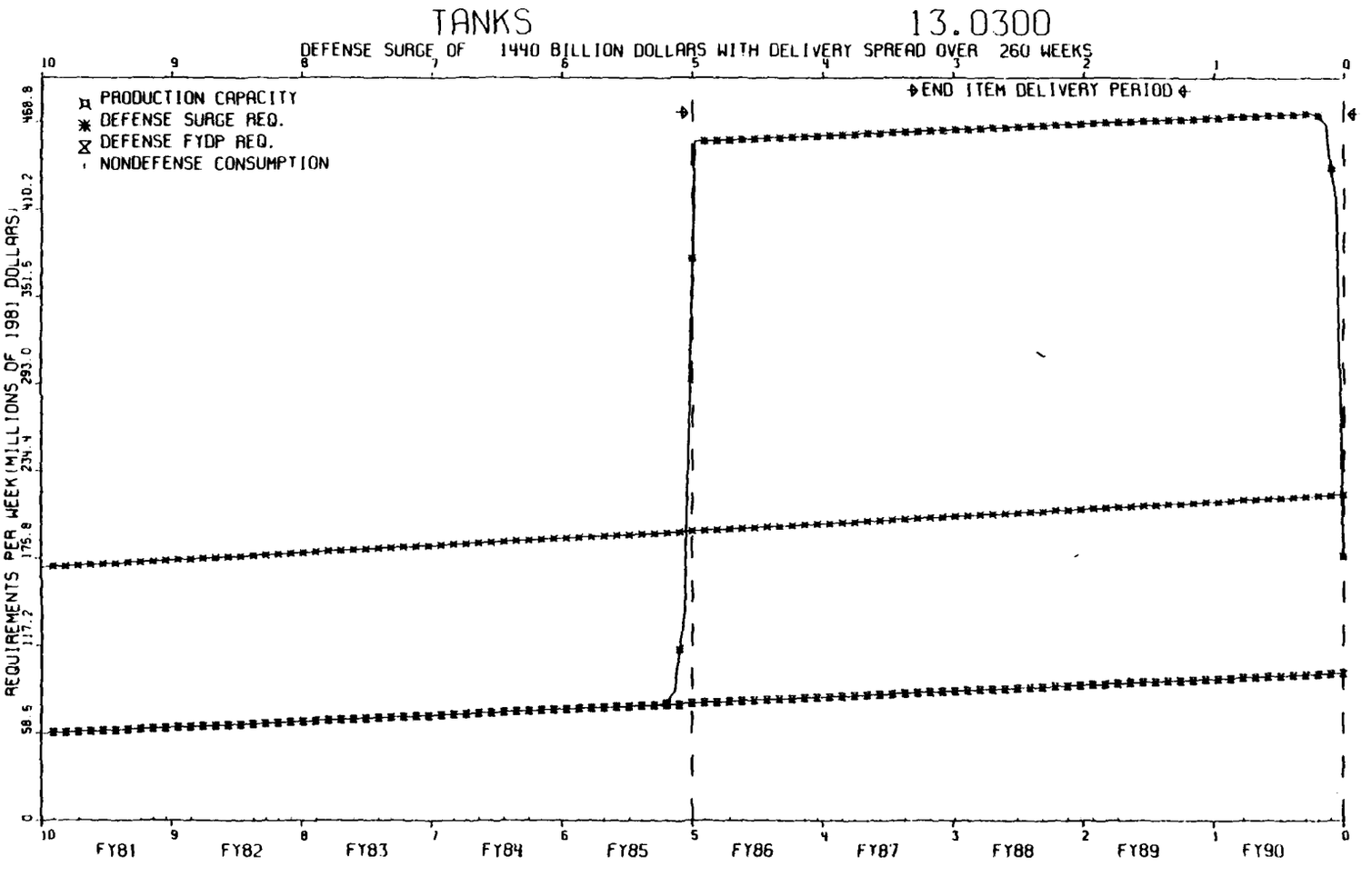

SHIPBUILDING
DEFENSE SURGE OF 350 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1951 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

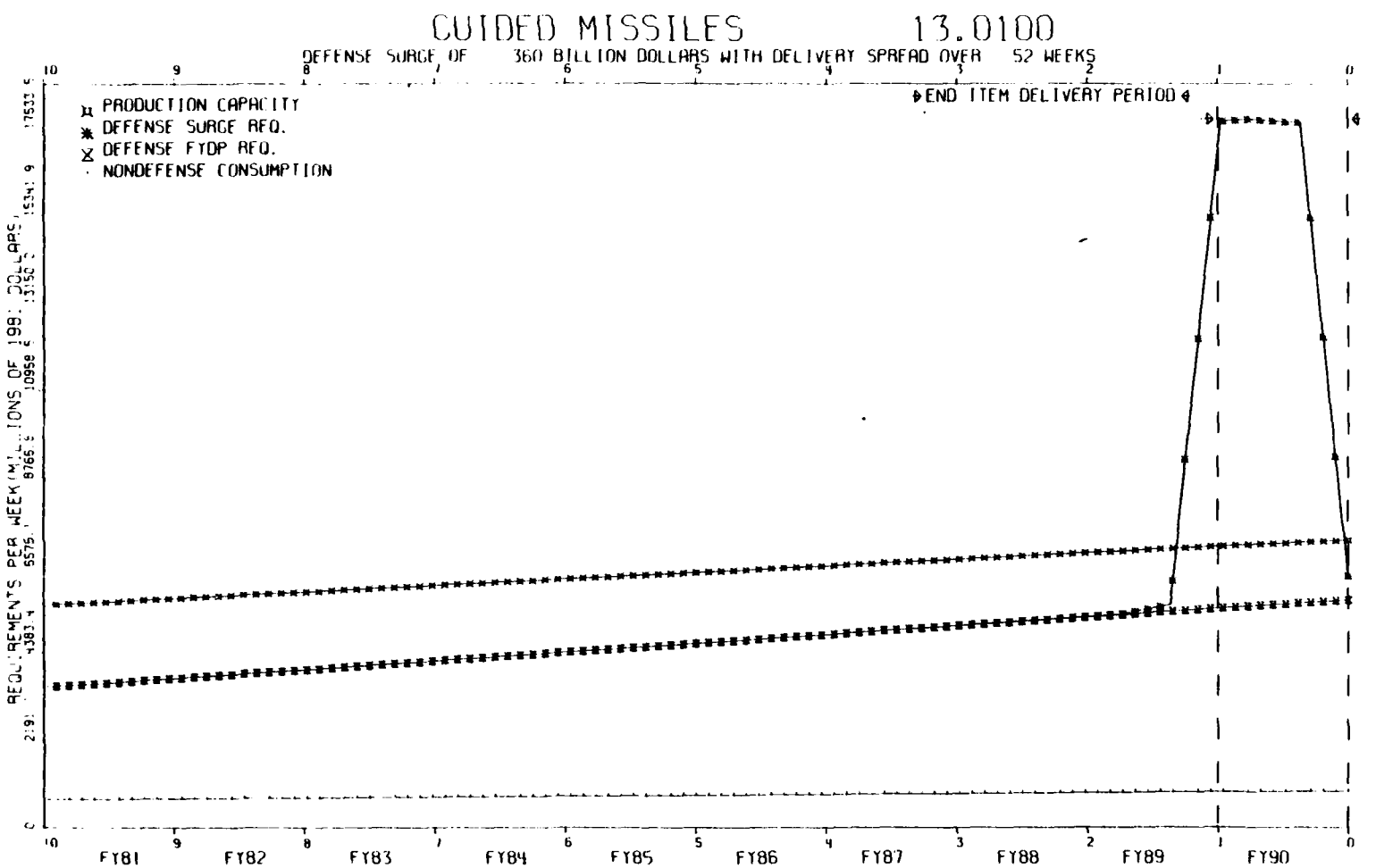

SHIPBUILDING 61.0100
DEFENSE SURGE OF 1940 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

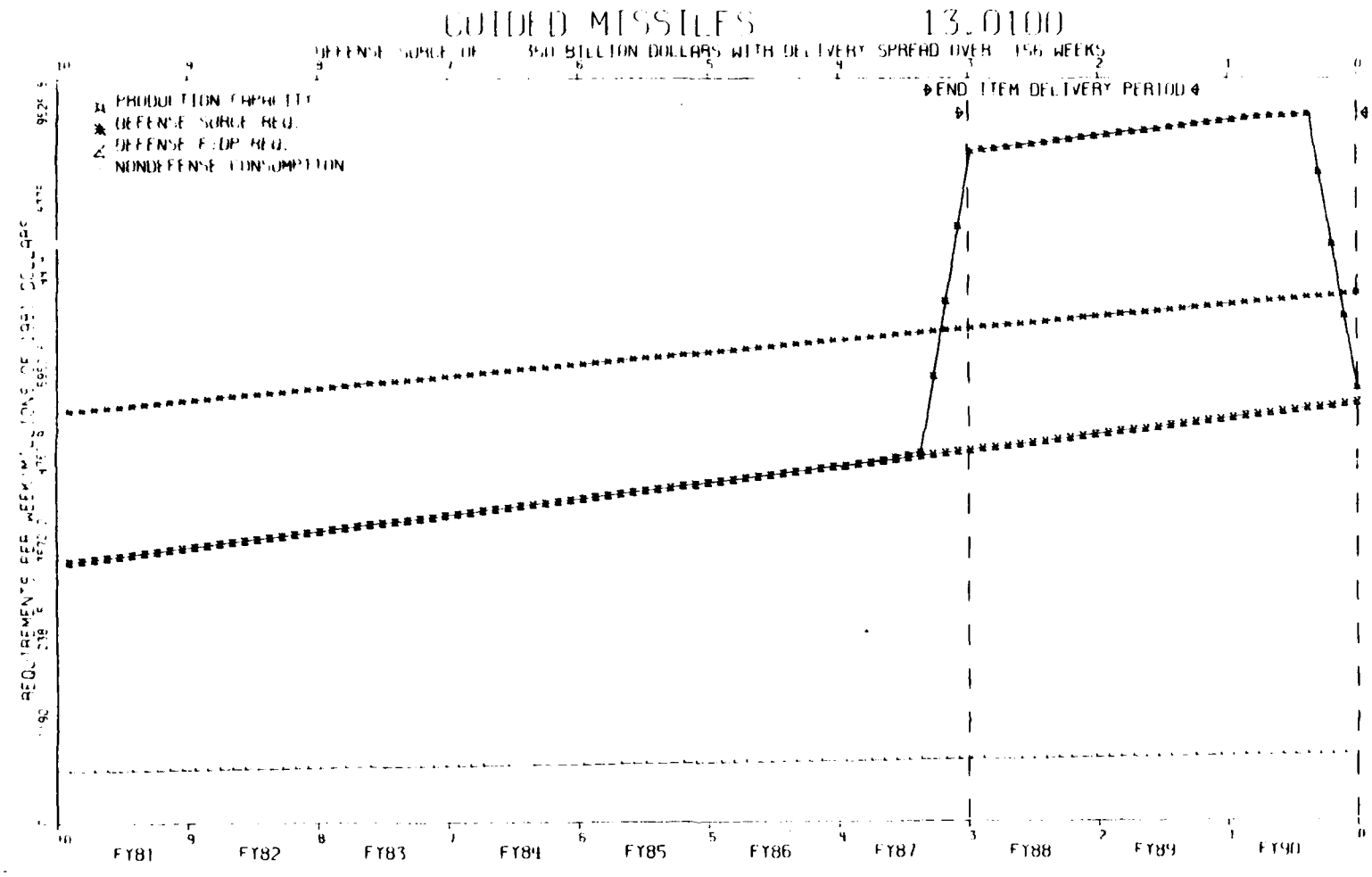

TANKS
13.0300
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
10 9 8 7 6 5 4 3 2 1 0
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
0
70.2
140.4
210.7
280.9
351.1
421.3
491.5
551.9
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

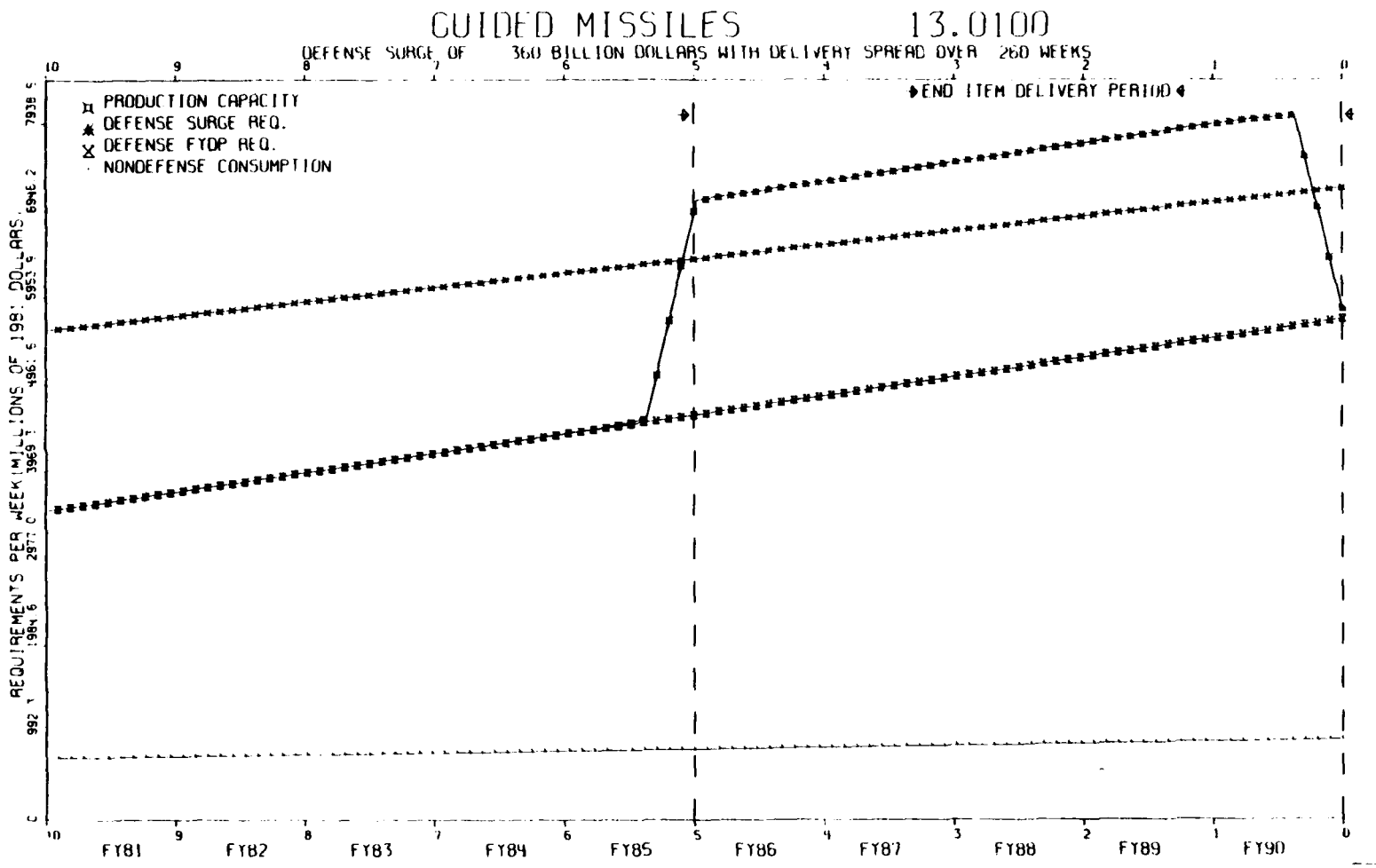

TANKS
13.0300
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK(MILLIONS OF 1981 DOLLARS)
0
31.5
62.9
94.4
125.9
157.4
188.9
220.3
251.8
10
9
8
7
6
5
4
3
2
1
0
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

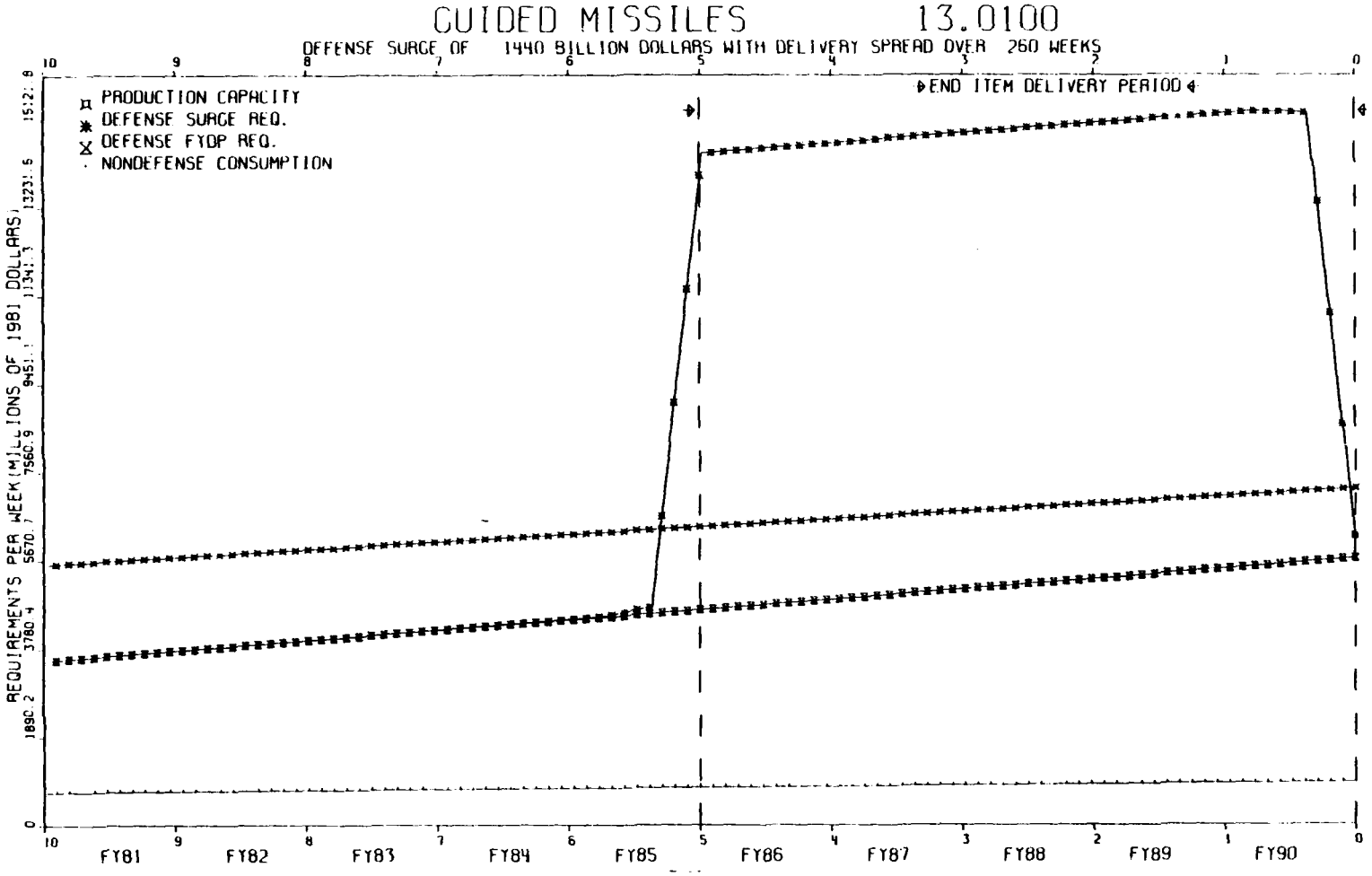

TANKS
13.0300
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

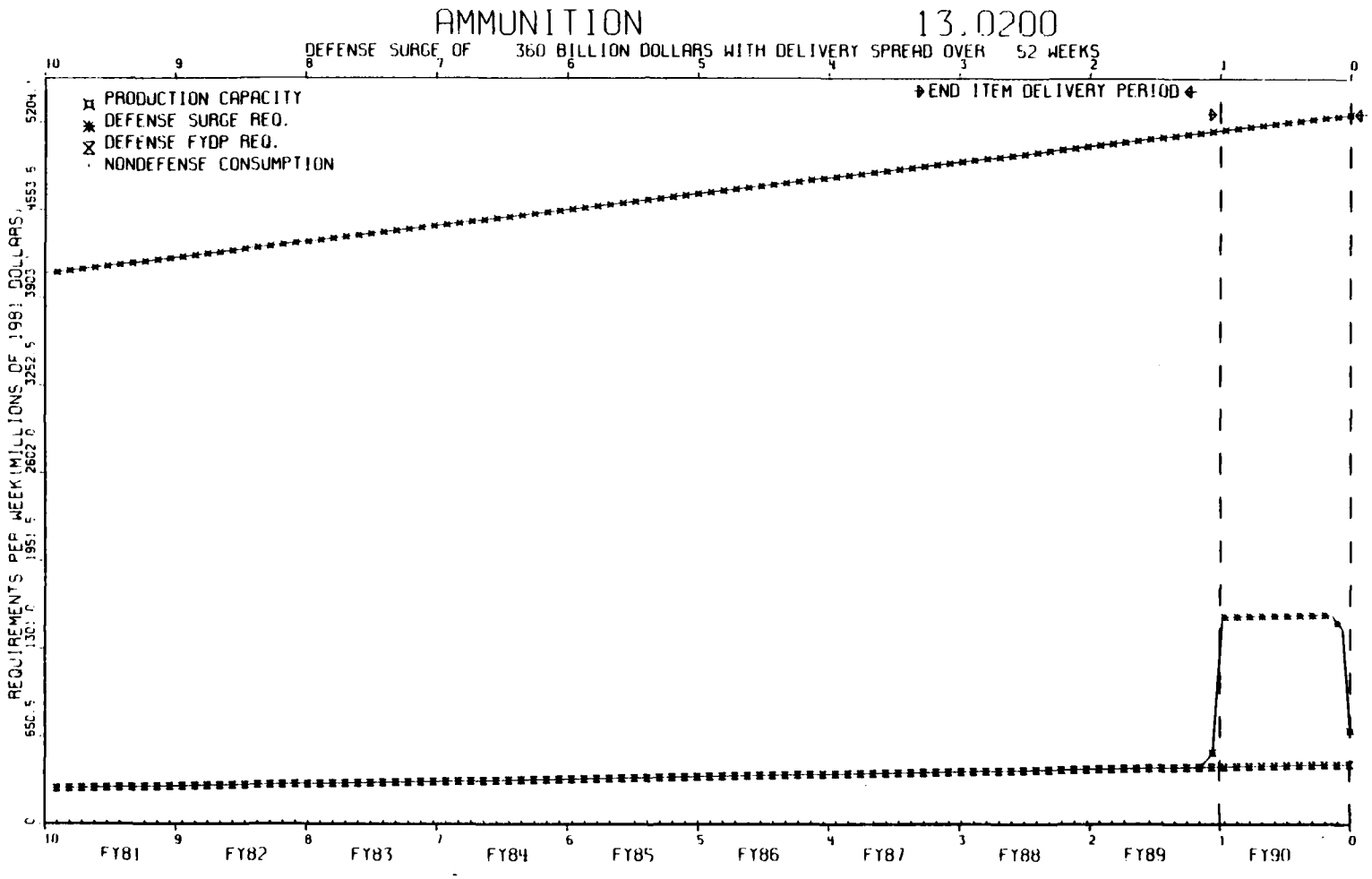

TANKS
13.0300
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
10 9 8 7 6 5 4 3 2 1 0
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
0
58.5
117.2
175.8
234.4
293.0
351.5
410.2
468.8
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

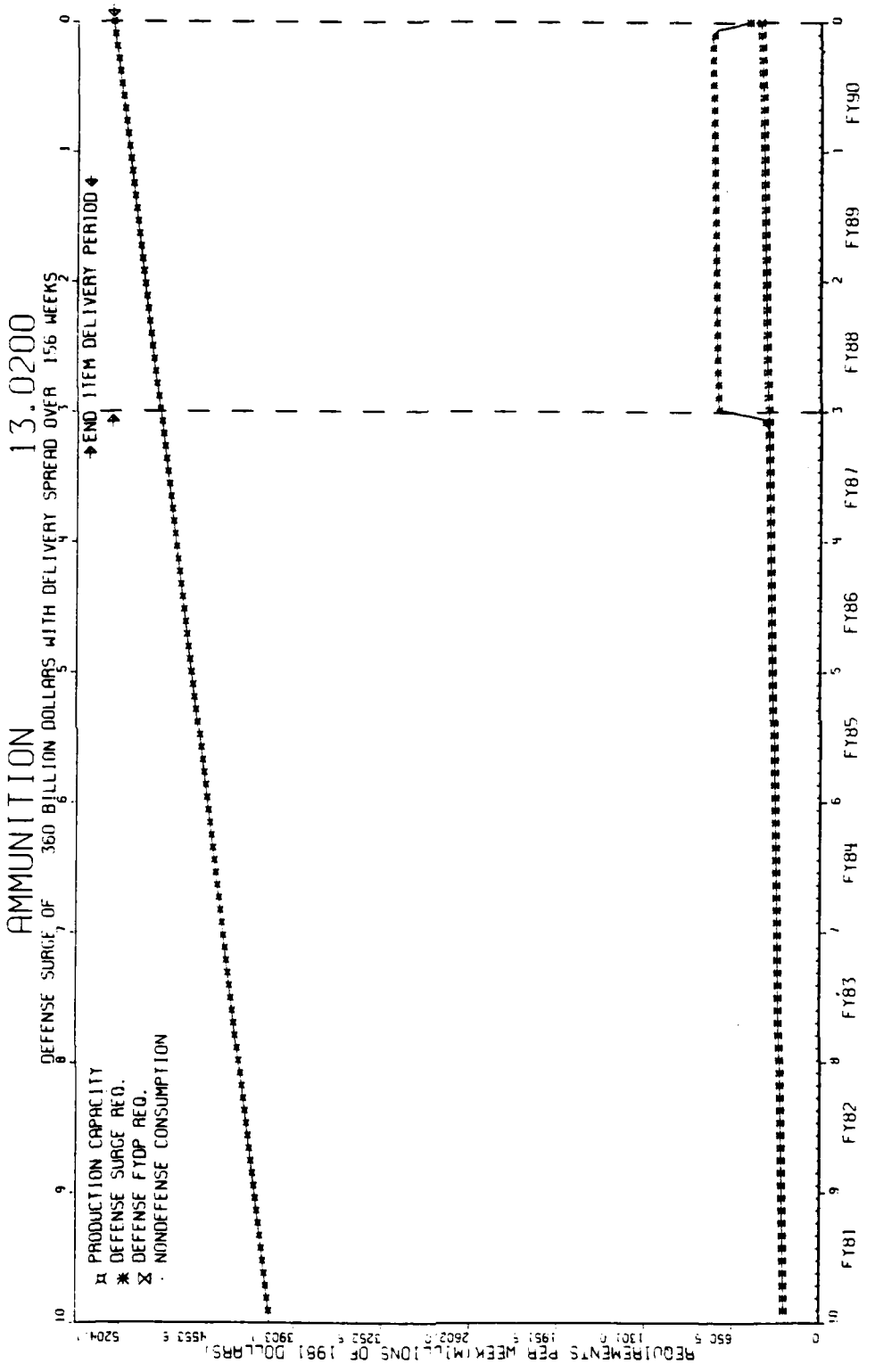

GUIDED MISSILES 13.0100
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

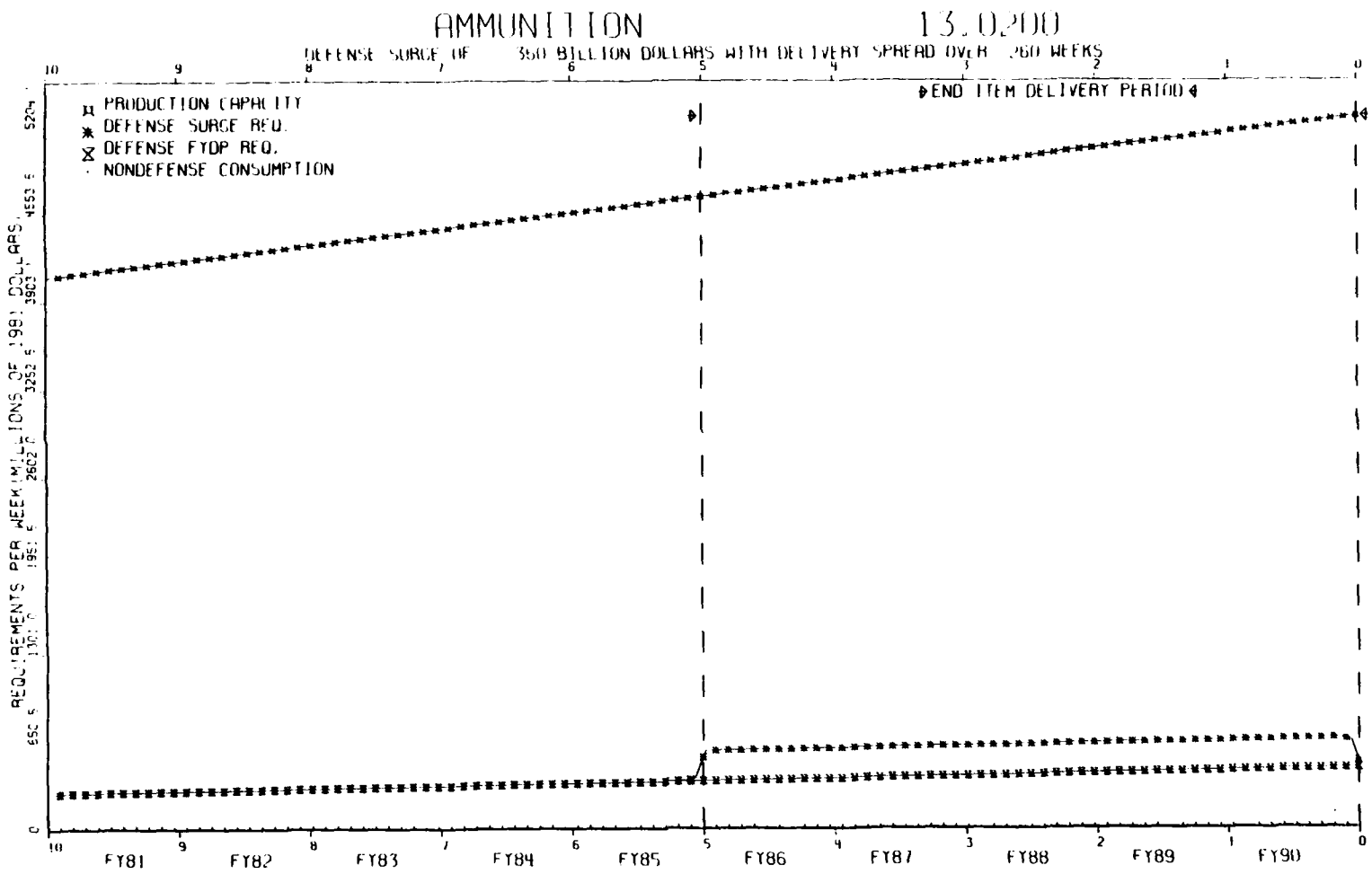

GUIDED MISSILES 13.0100
DEFENSE SOURCE OF ... BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SOURCE REQ.
DEFENSE E.O.P. REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

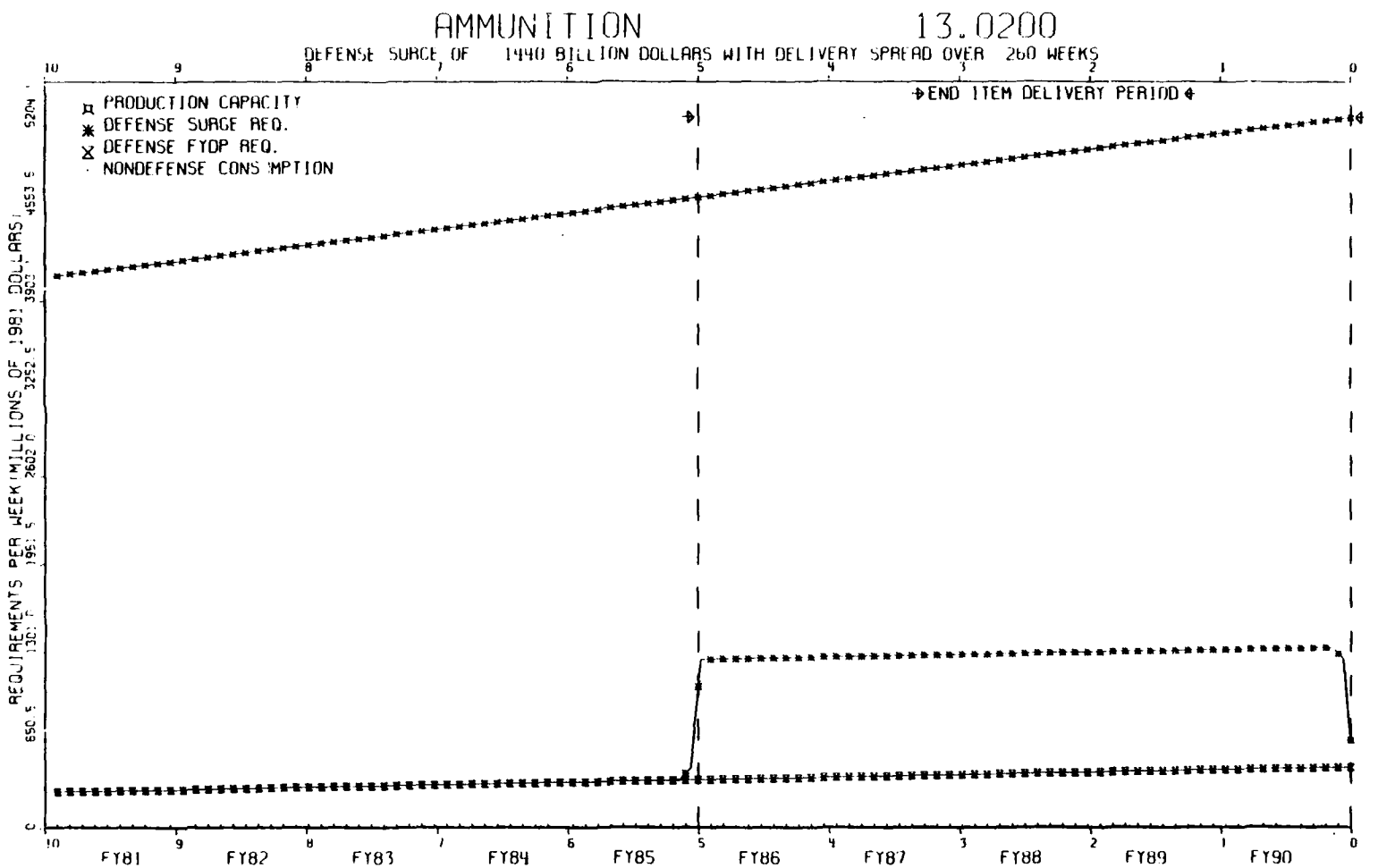

GUIDED MISSILES 13.0100
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
7938
6946.2
5953.5
4961.8
3969.1
2977.0
1984.6
992
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

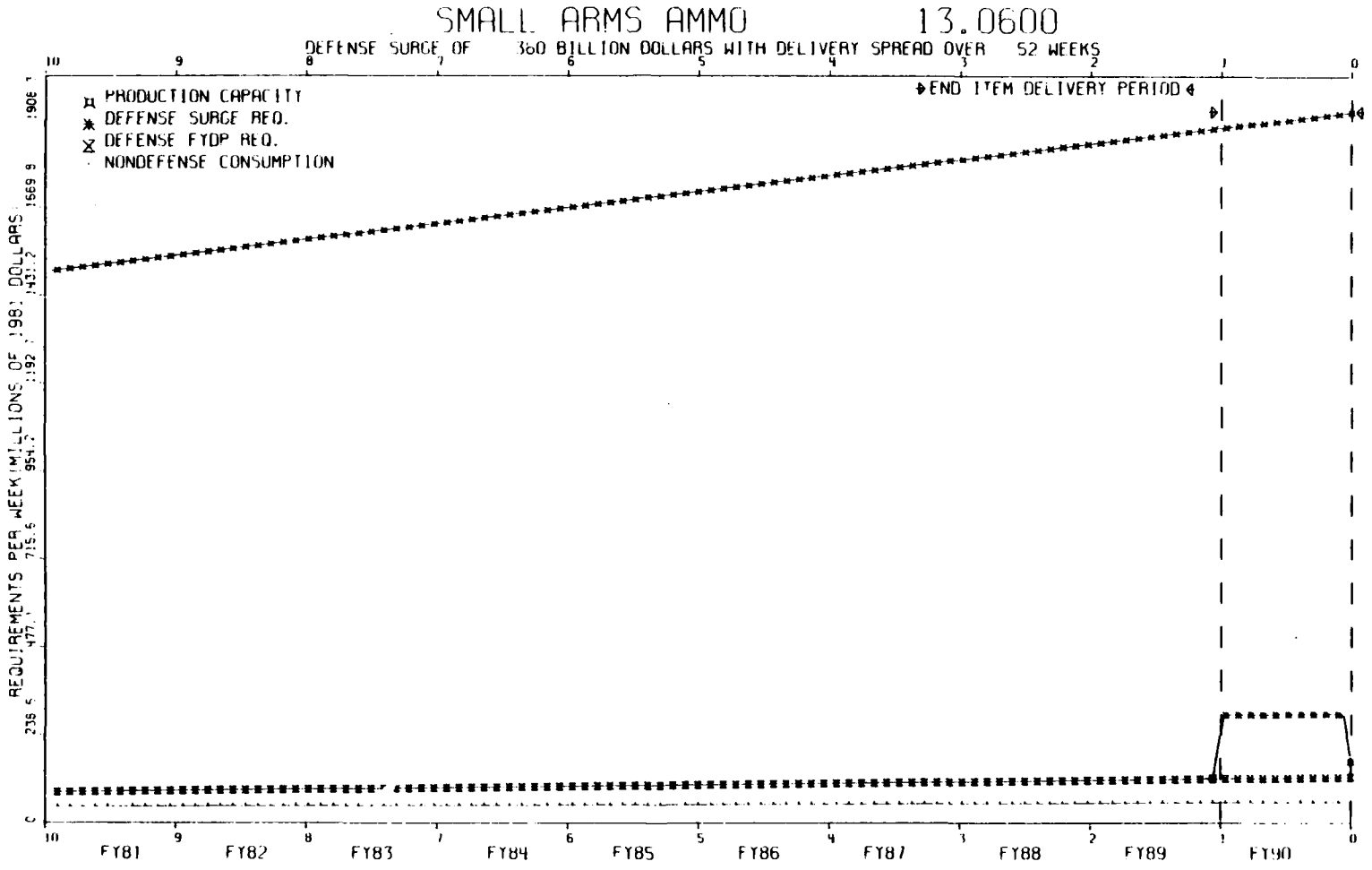

GUIDED MISSILES 13.0100
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
15121.8
13231.5
11341.3
9451.1
7560.9
5670.7
3780.4
1890.2
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

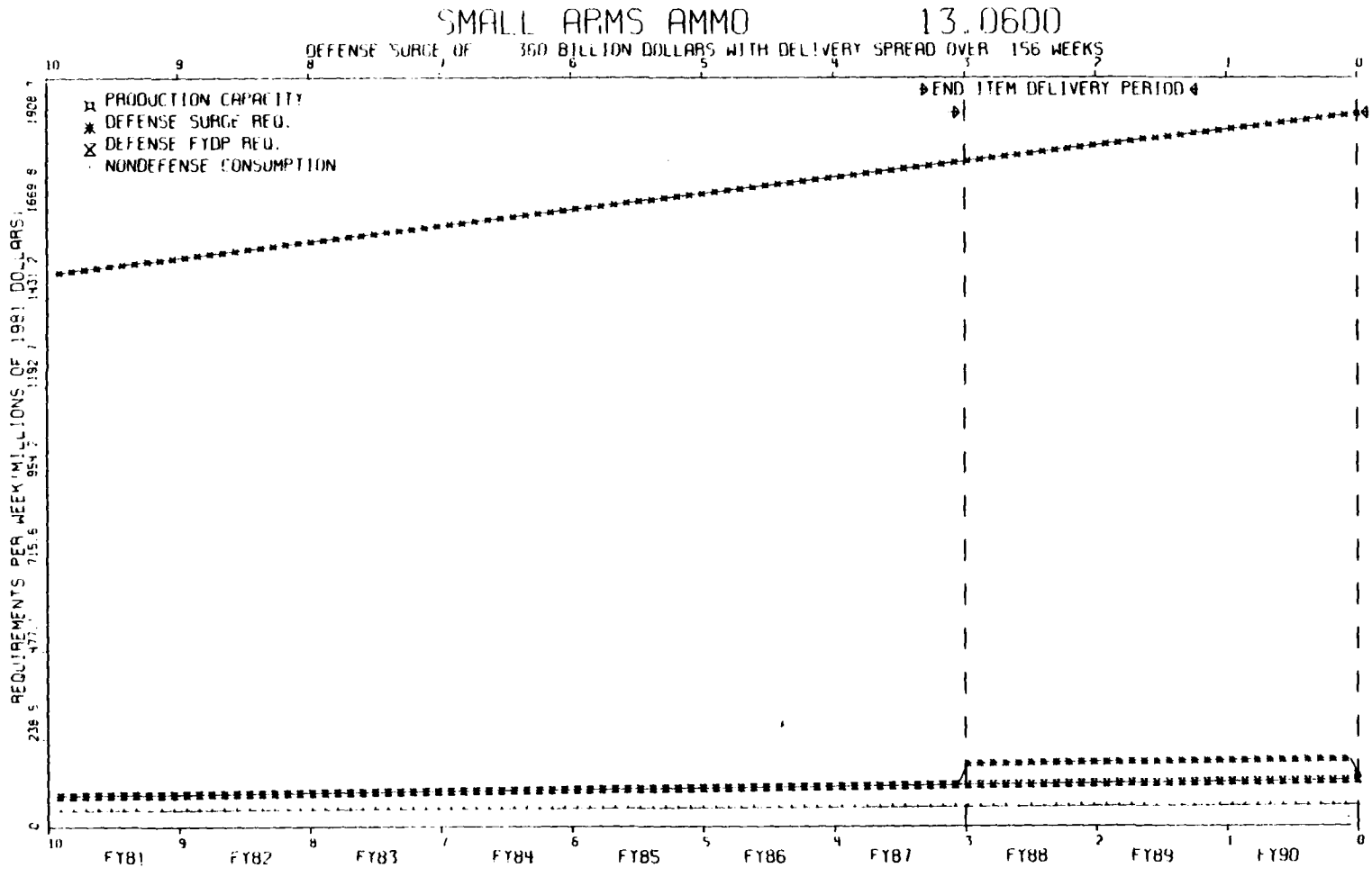

AMMUNITION 13.0200
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

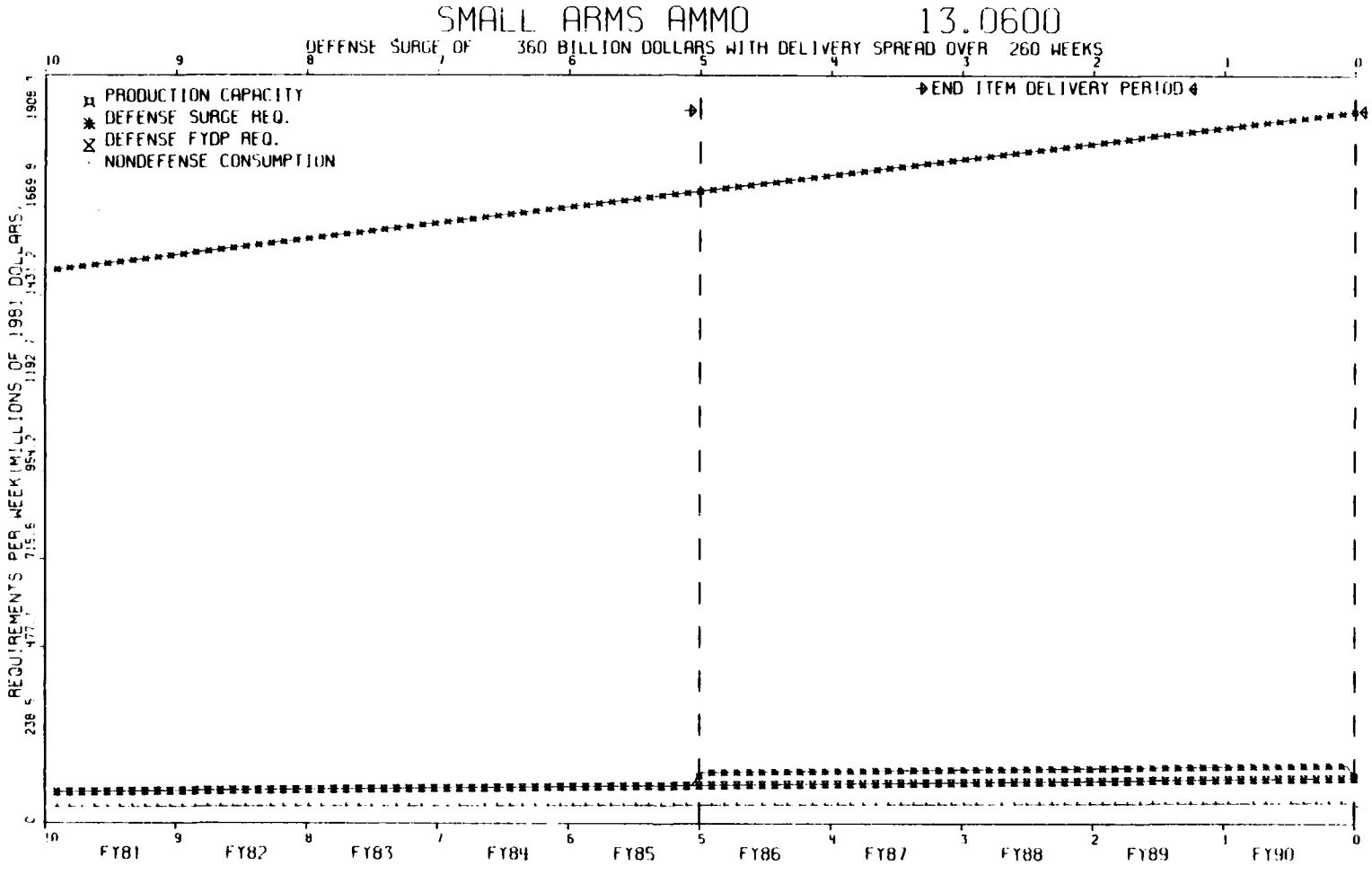

AMMUNITION
13.0200
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
650.5
1301.0
1951.5
2602.0
3252.5
3903.1
4553.6
5204.1
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

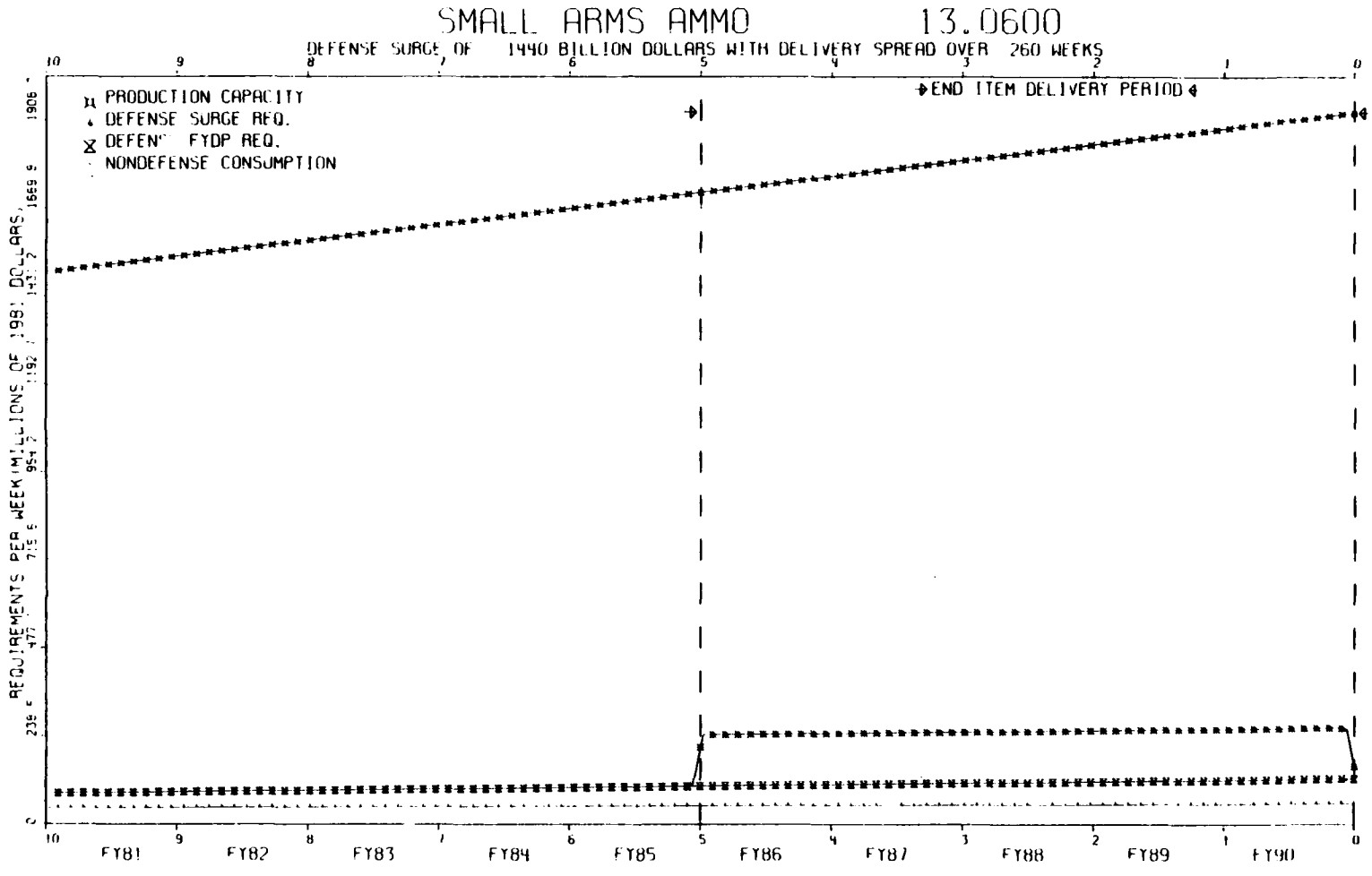

AMMUNITION 13.0200
DEFENSE SURGE OF 350 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

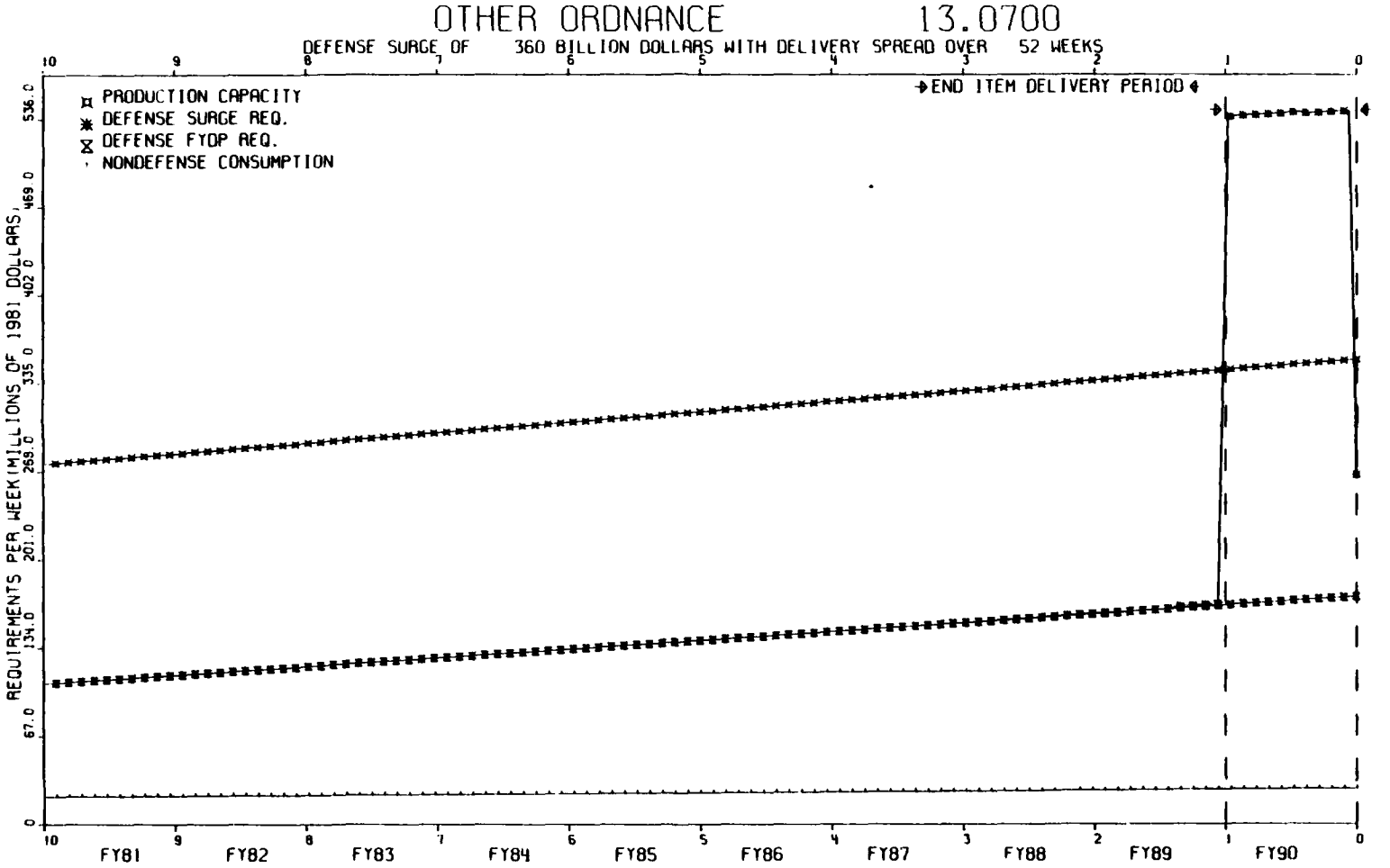

AMMUNITION 13.0200
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

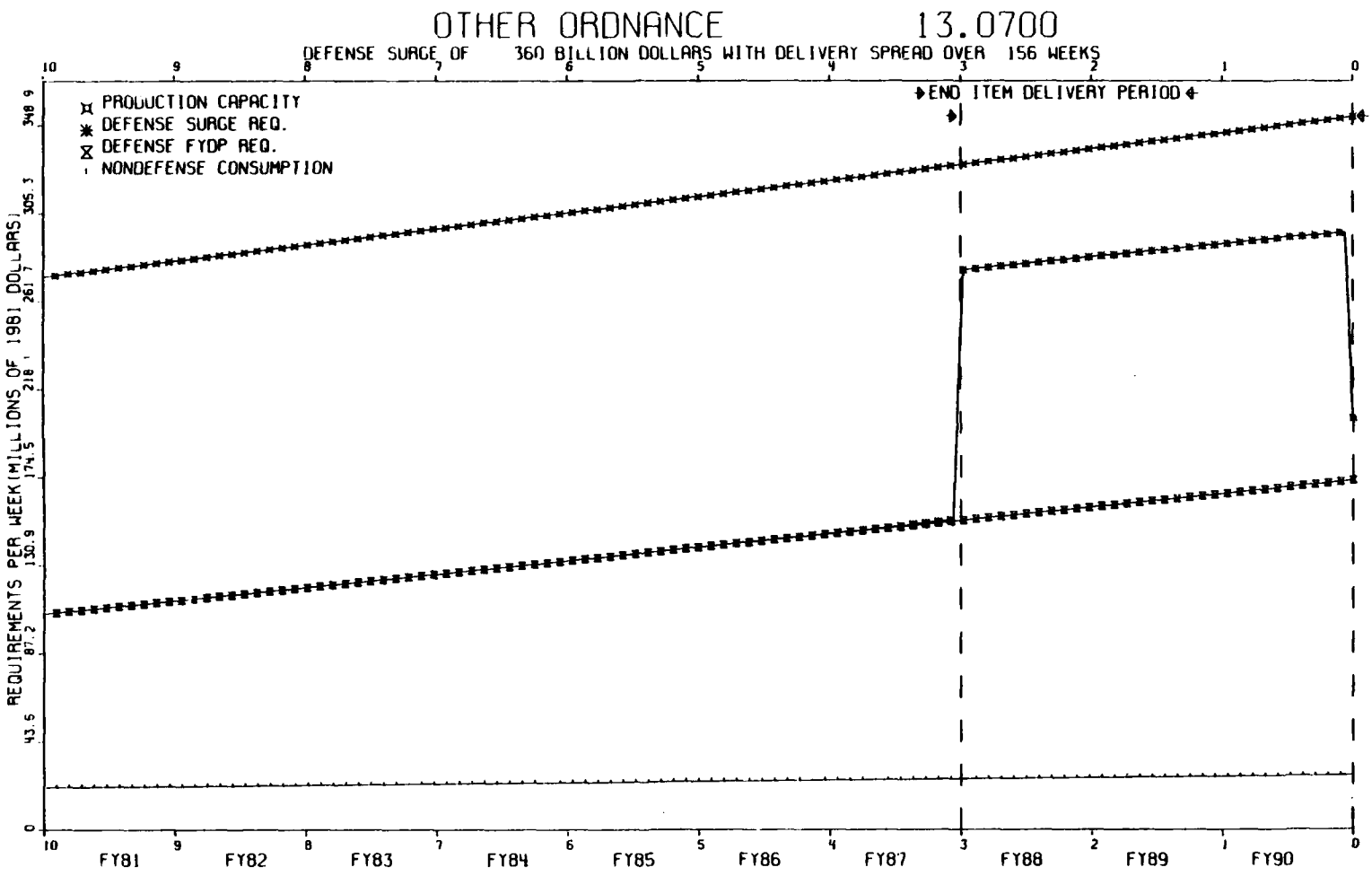

SMALL ARMS AMMO 13.0600
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK IN MILLIONS OF 1981 DOLLARS
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

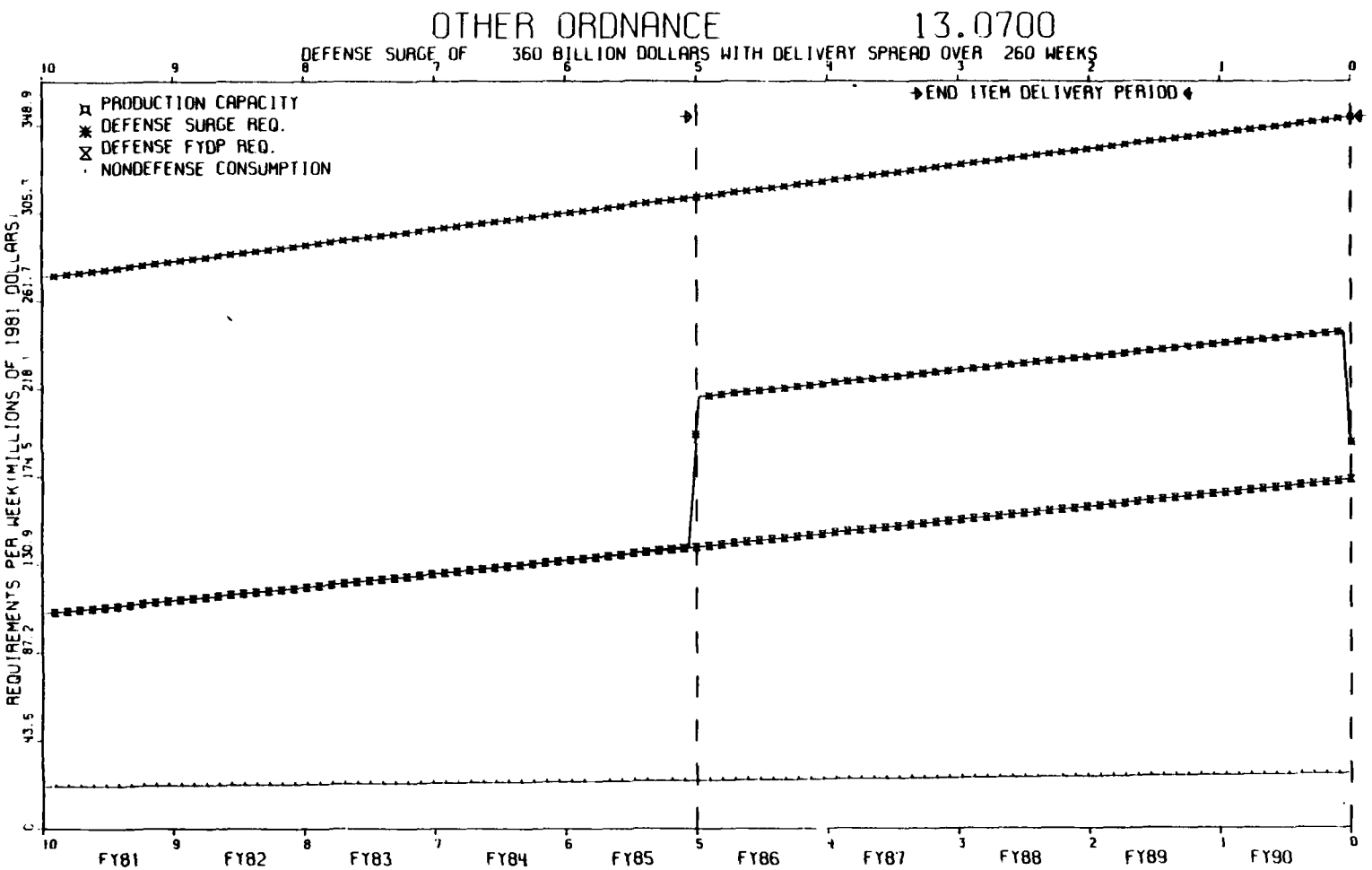

SMALL ARMS AMMO 13.0600
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
10 9 8 7 6 5 4 3 2 1 0
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
1908.7
1669.8
1431.7
1192.7
954.5
715.6
477.
238.5
0
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

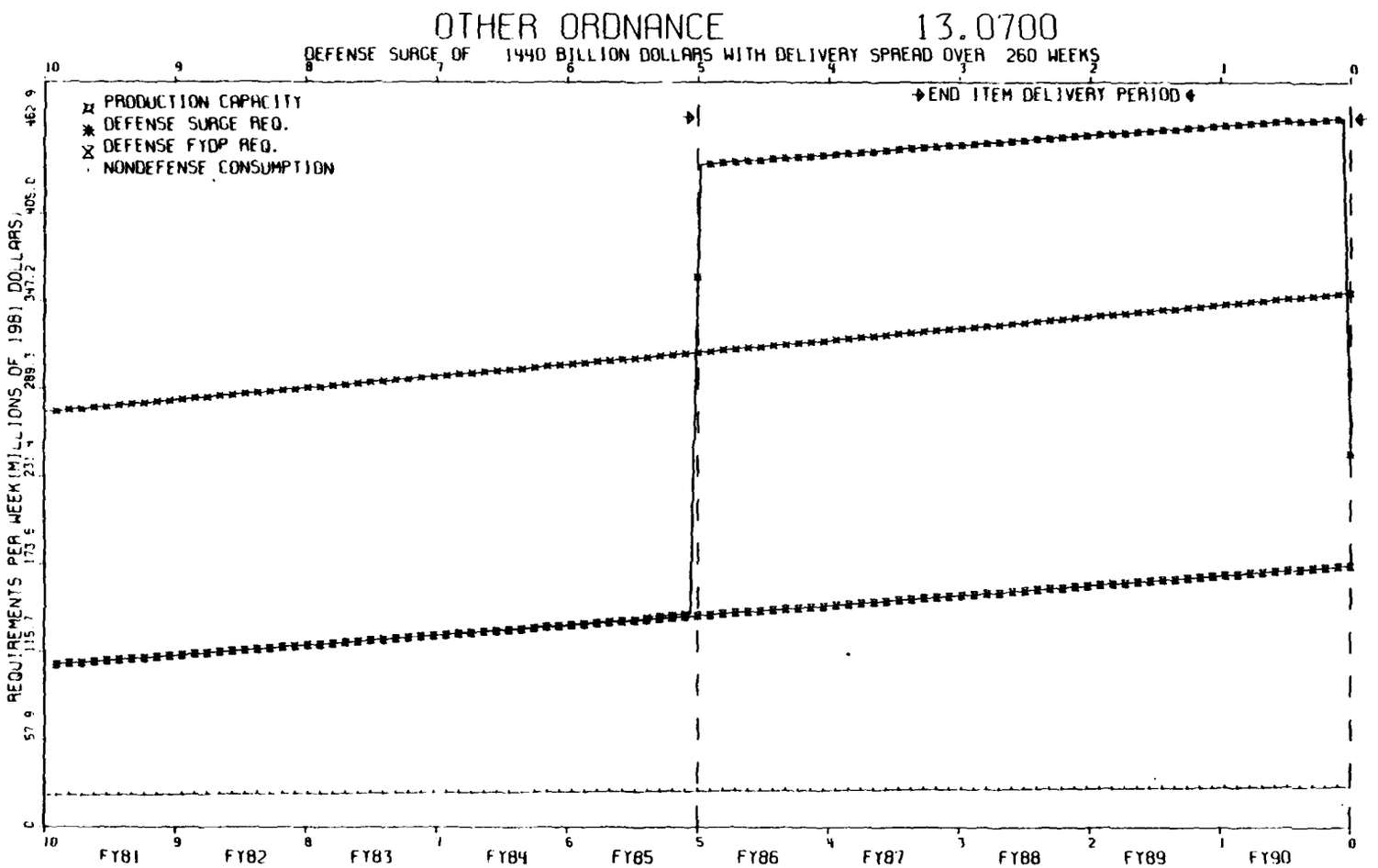

SMALL ARMS AMMO 13.0600
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
1905.9
1669.9
1431.2
1192.2
954.2
715.6
477.1
238.5
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

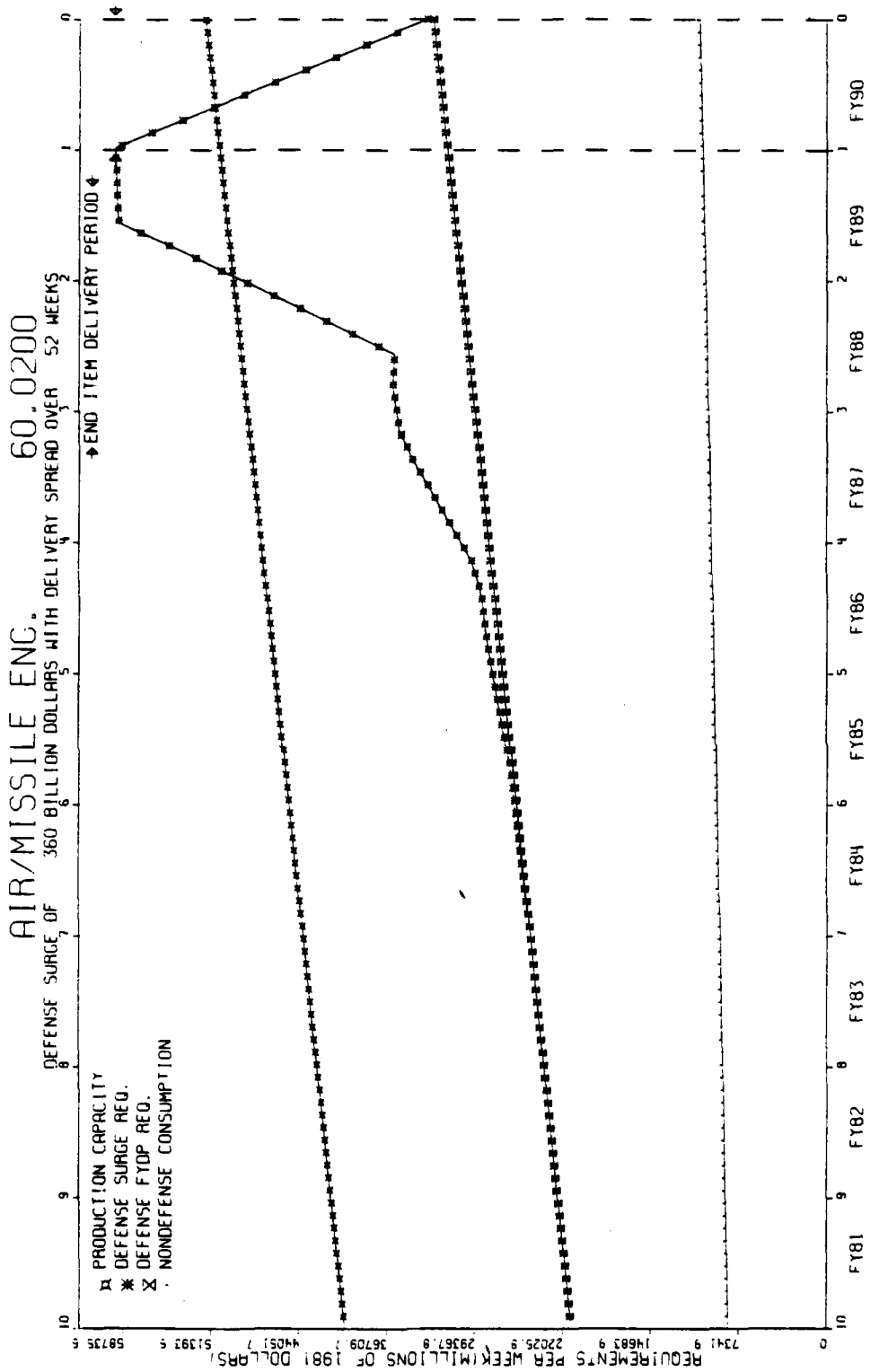

SMALL ARMS AMMO 13.0600
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFEN FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
1906
1669
1192
954
715
477
239
0
10
9
8
7
6
5
4
3
2
1
0
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

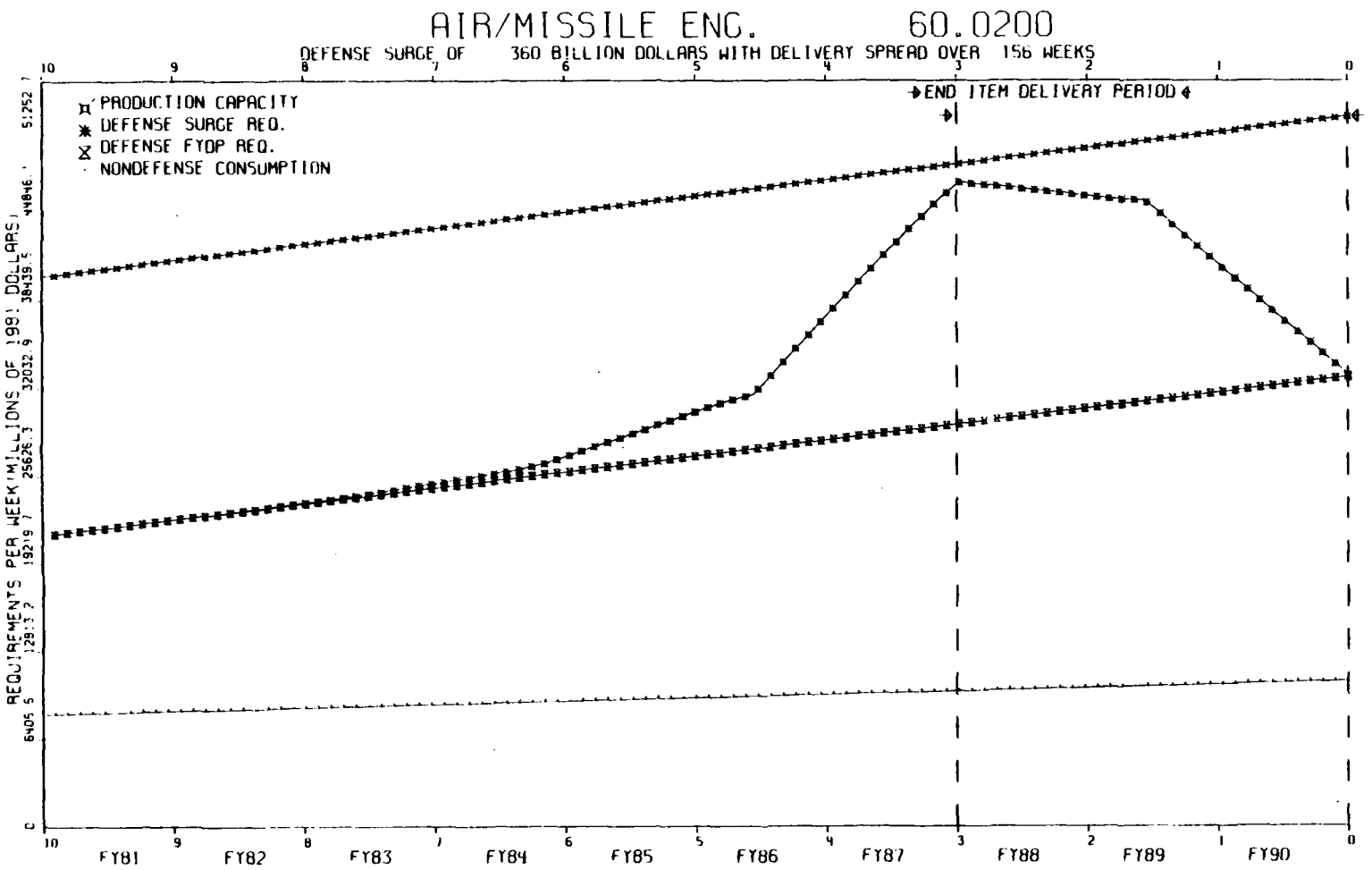

OTHER ORDNANCE 13.0700
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
10 9 8 7 6 5 4 3 2 1 0
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
536.0
469.0
402.0
335.0
268.0
201.0
134.0
67.0
0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

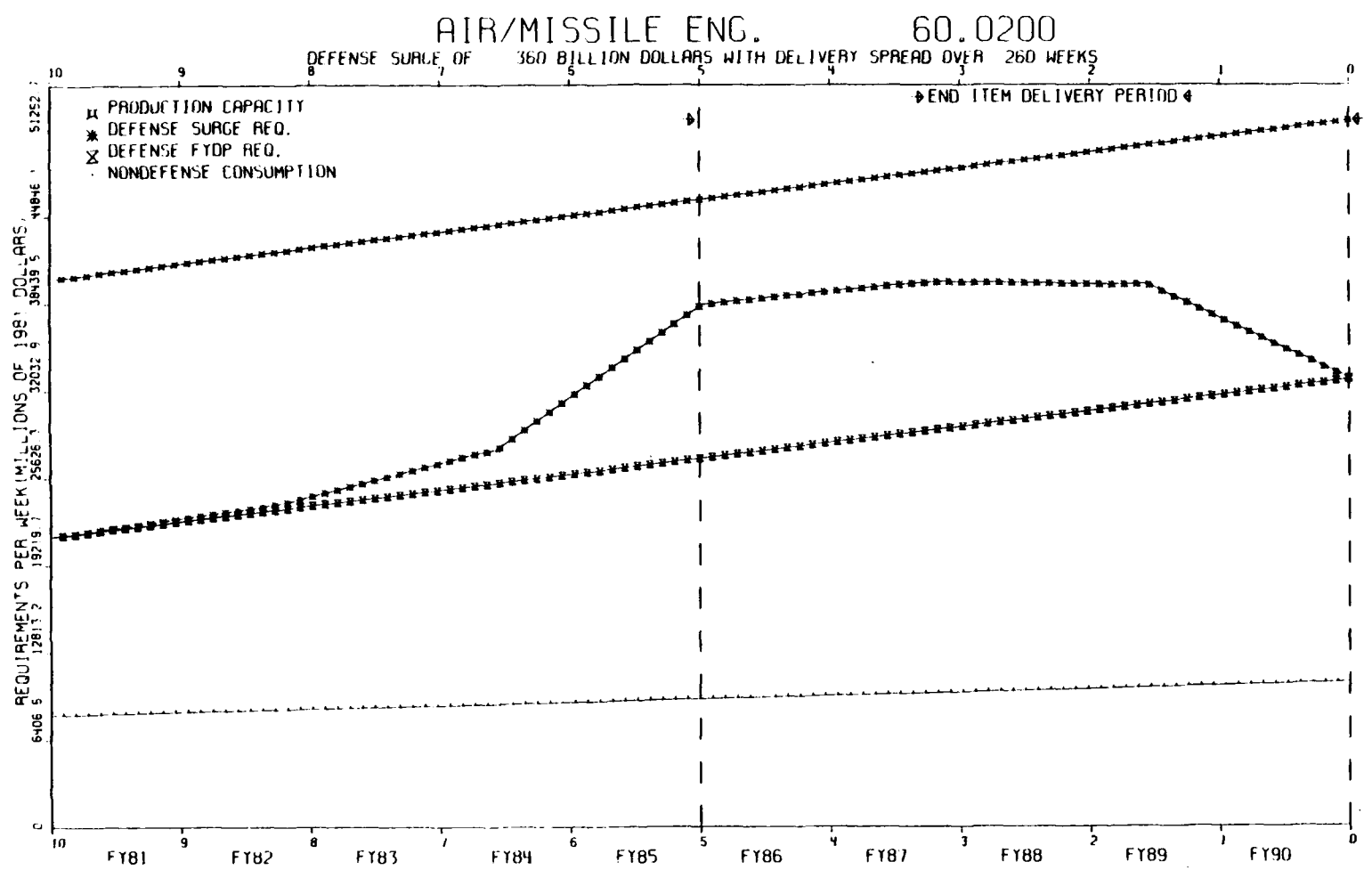

OTHER ORDNANCE 13.0700
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
10 9 8 7 6 5 4 3 2 1 0
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK(MILLIONS OF 1981 DOLLARS)
348.9
305.3
261.7
218.1
174.5
130.9
87.2
43.6
0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

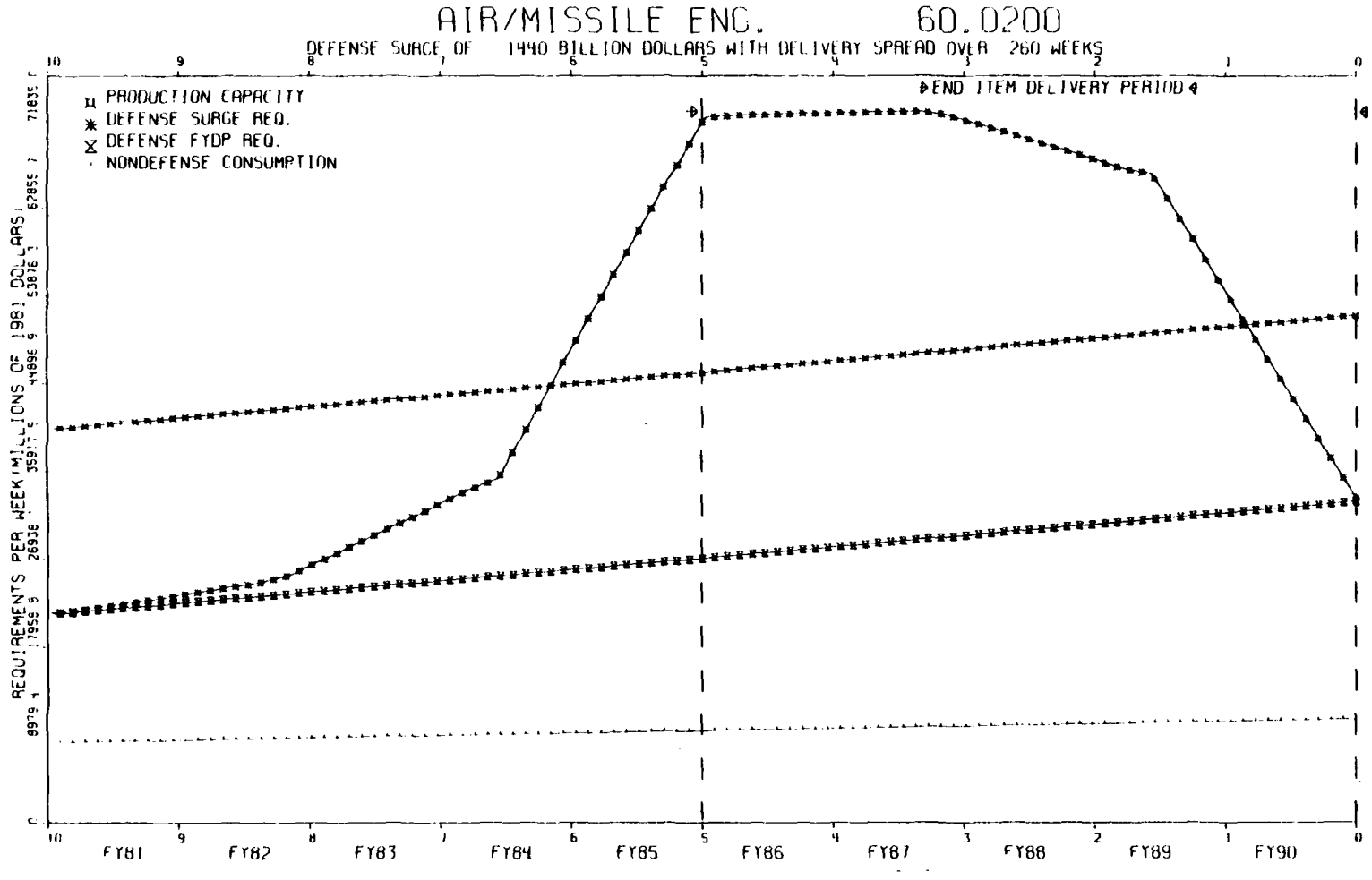

OTHER ORDNANCE 13.0700
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
348.9
305.7
261.7
218.1
174.5
130.9
87.2
43.5
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

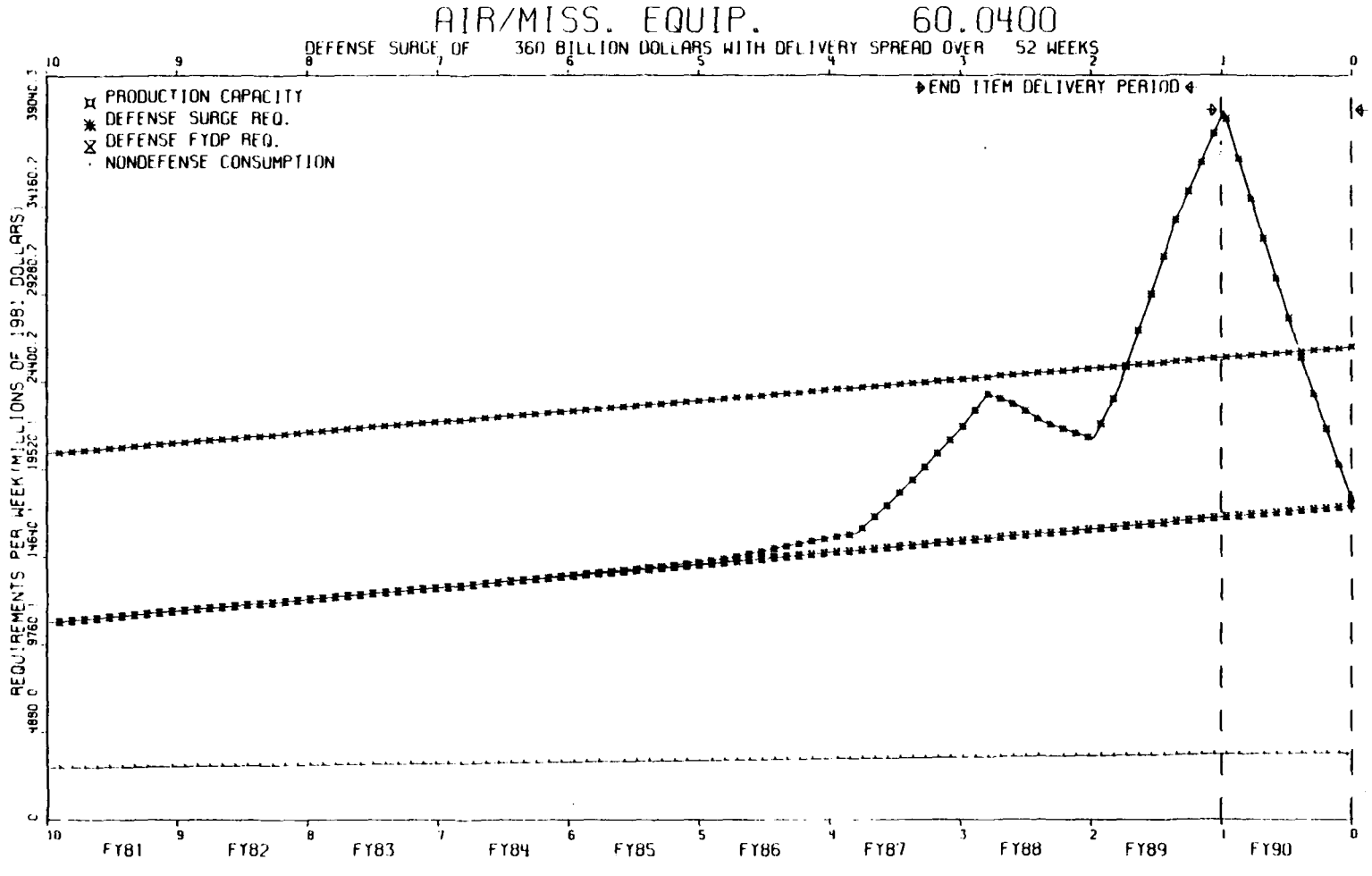

OTHER ORDNANCE 13.0700
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
0
57.9
115.7
173.6
231.4
289.3
347.2
405.0
462.9
10
9
8
7
6
5
4
3
2
1
0
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

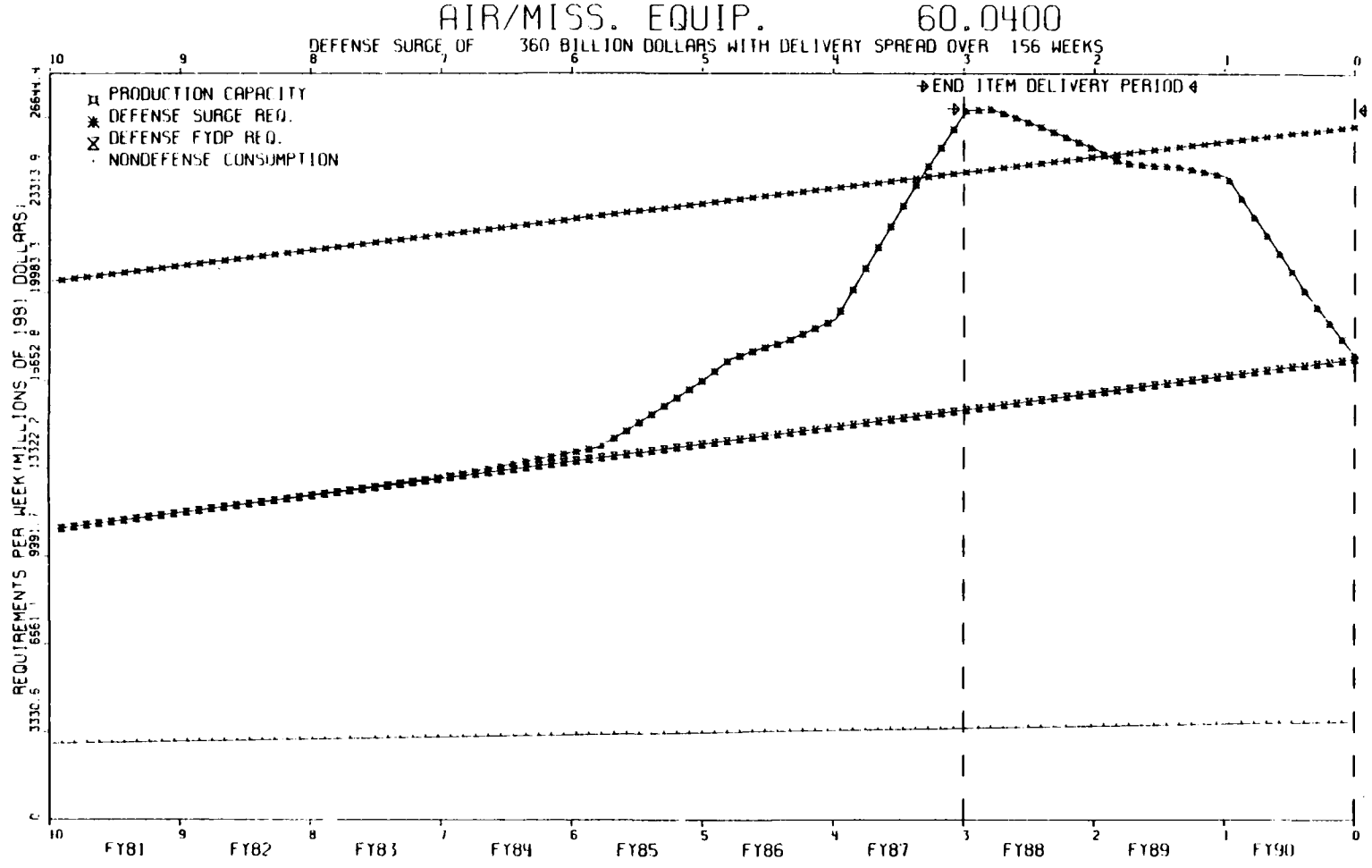

AIR/MISSILE ENG. 60.0200
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK(MILLIONS OF 1981 DOLLARS)
0
7341.9
14683.9
22025.9
29367.8
36709.7
44051.7
51393.5
58735.5
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90


AIR/MISSILE ENG. 60.0200
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90


AIR/MISSILE ENG. 60.0200
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90


AIR/MISSILE ENG. 60.0200
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK IN BILLIONS OF 1981 DOLLARS
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90


AIR/MISS. EQUIP. 60.0400
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
0
9760
14640
19520
24400
29280
34160
39040
10
9
8
7
6
5
4
3
2
1
0
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90


AIR/MISS. EQUIP. 60.0400
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
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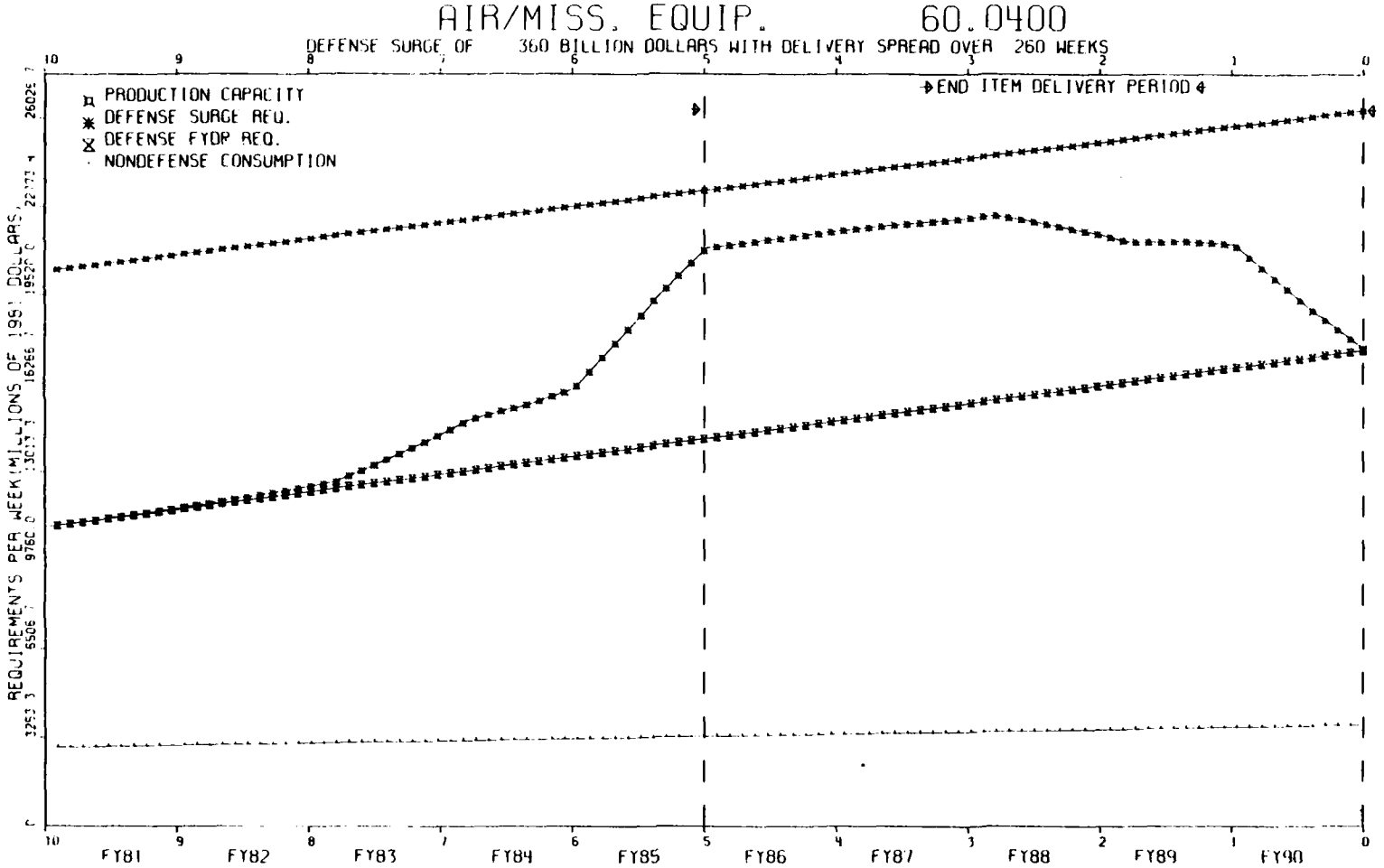
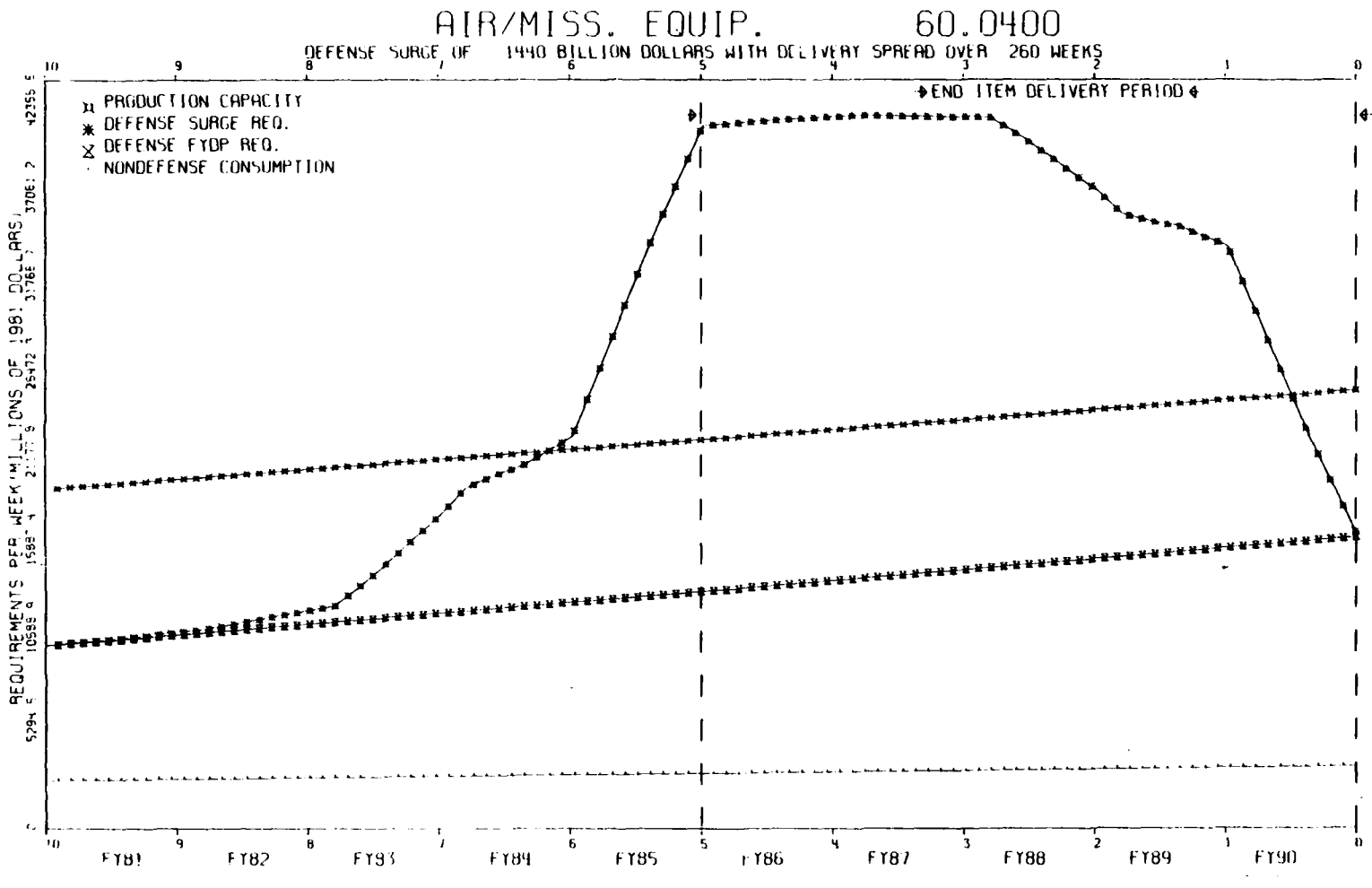
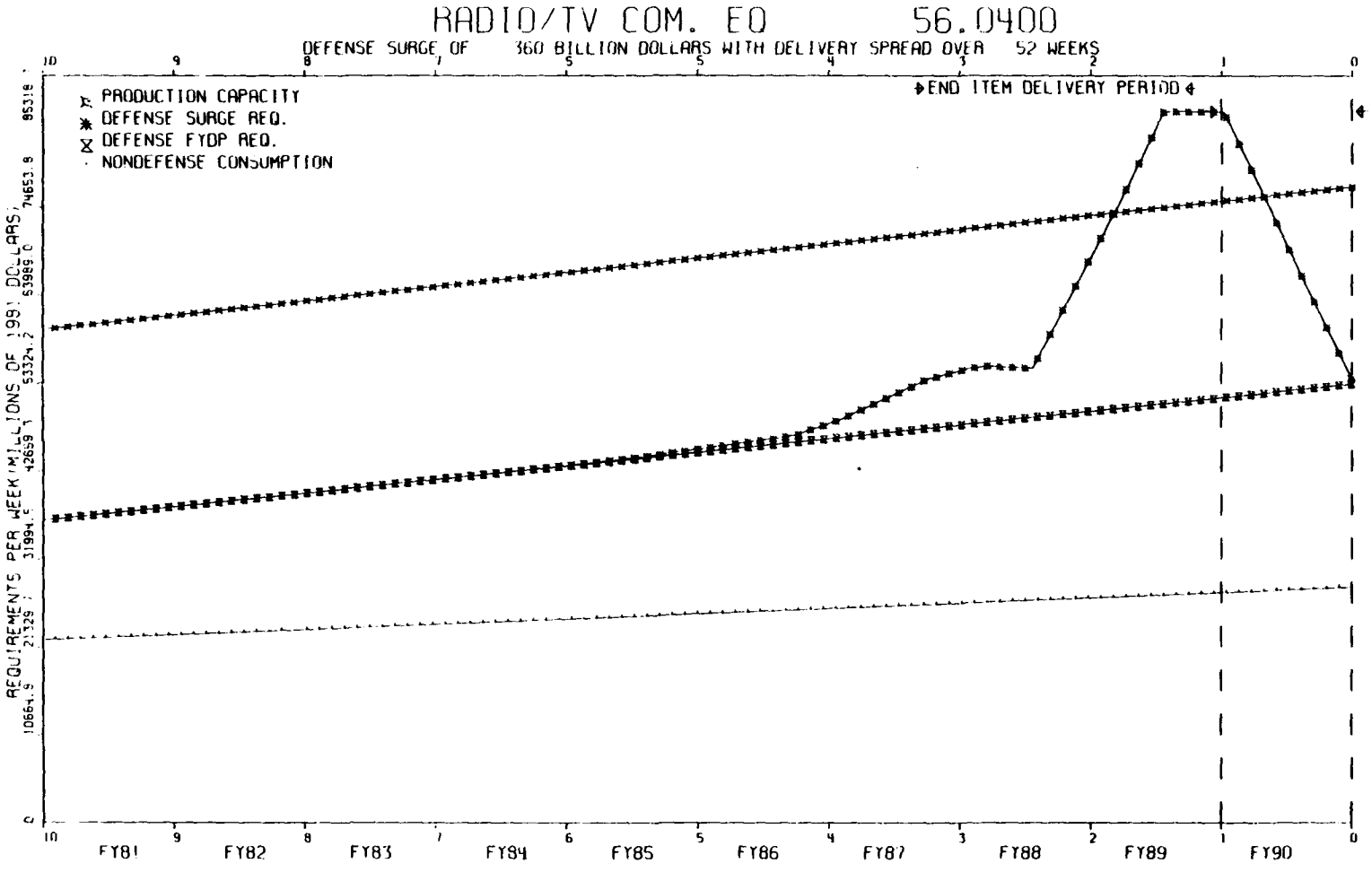
FY89
FY90


AIR/MISS. EQUIP. 60.0400
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90


AIR/MISS. EQUIP. 60.0400
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90


RADIO/TV COM. EQ 56.0400
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
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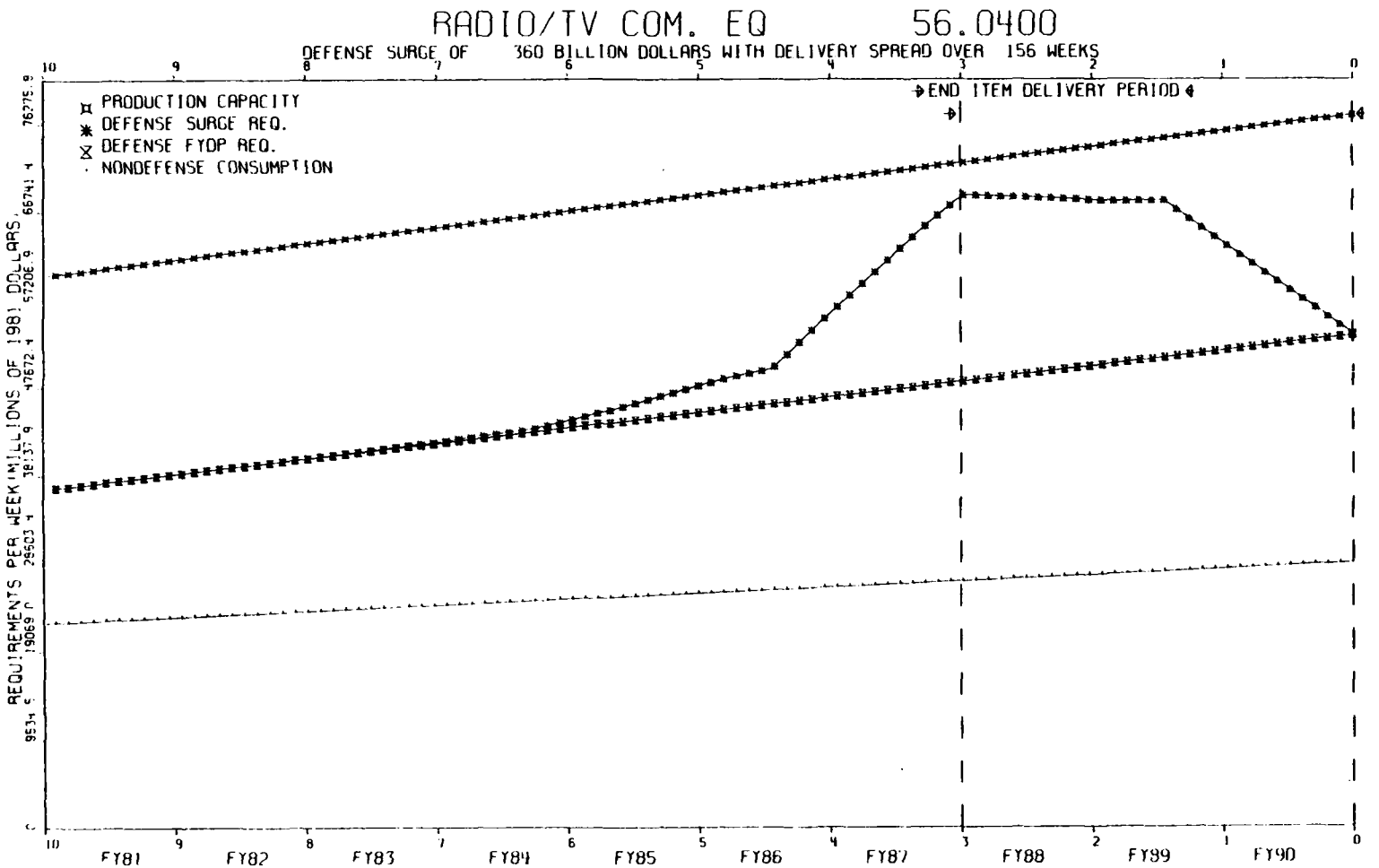
FY89
FY90


RADIO/TV COM. EQ 56.0400
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK IN BILLIONS OF 1981 DOLLARS
FY81
FY82
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FY86
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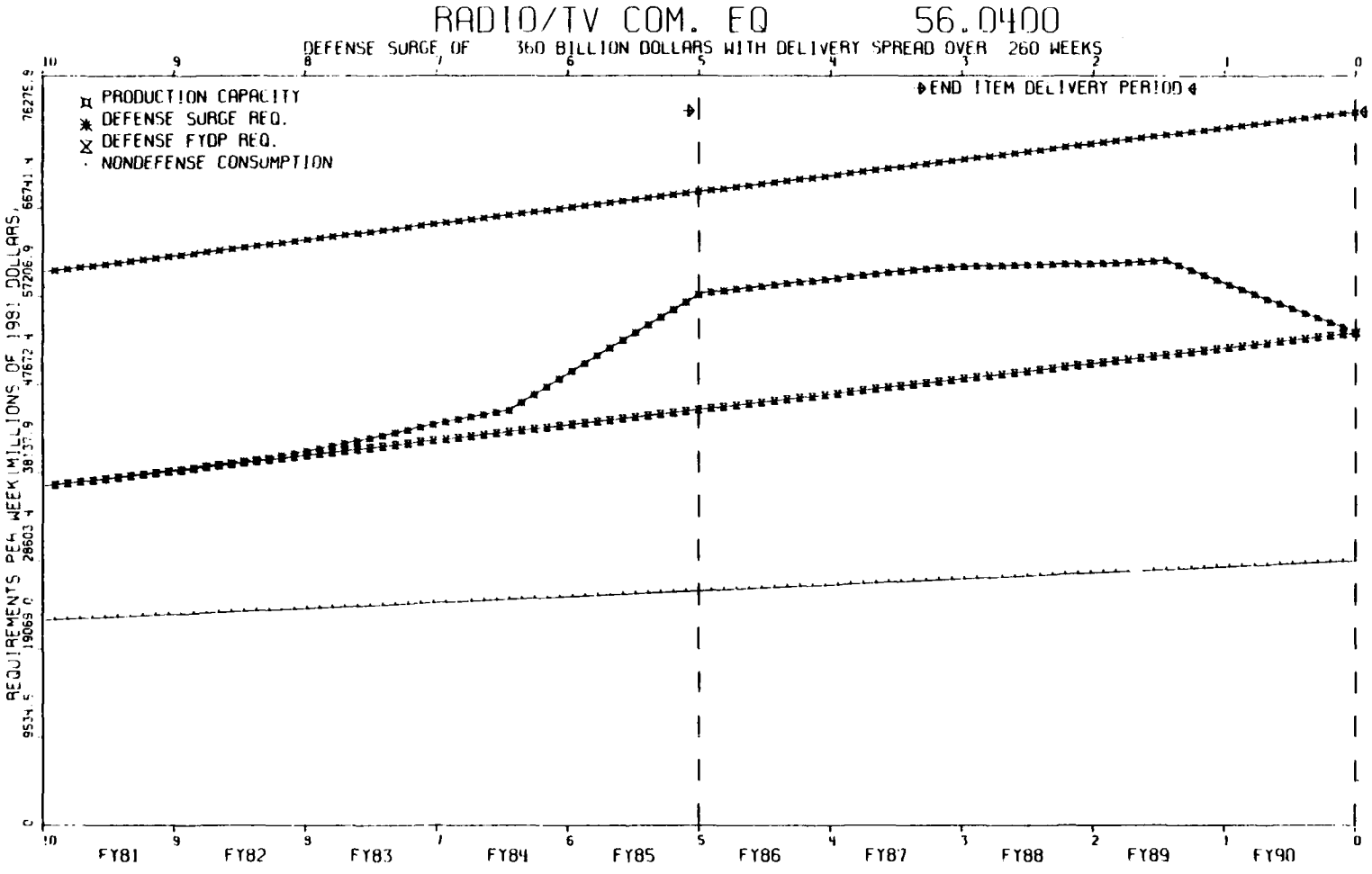
FY89
FY90


RADIO/TV COM. EQ 56.0400
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
76275.9
66741.4
57206.9
47672.4
38137.9
28603.4
19069.0
9534.5
0
10
9
8
7
6
5
4
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FY81
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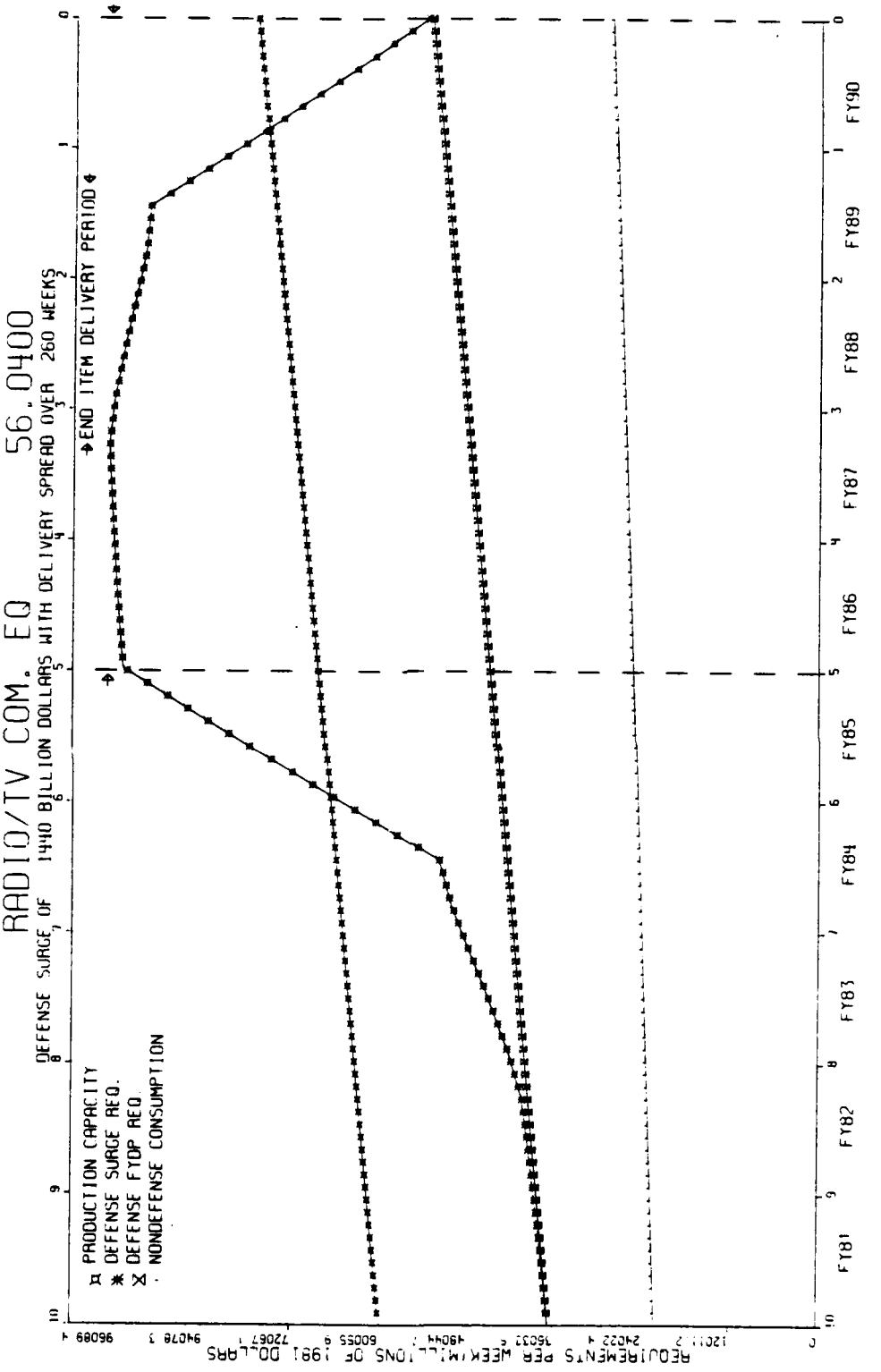
RADIO/TV COM. EQ 56.0400
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS
FY81
FY82
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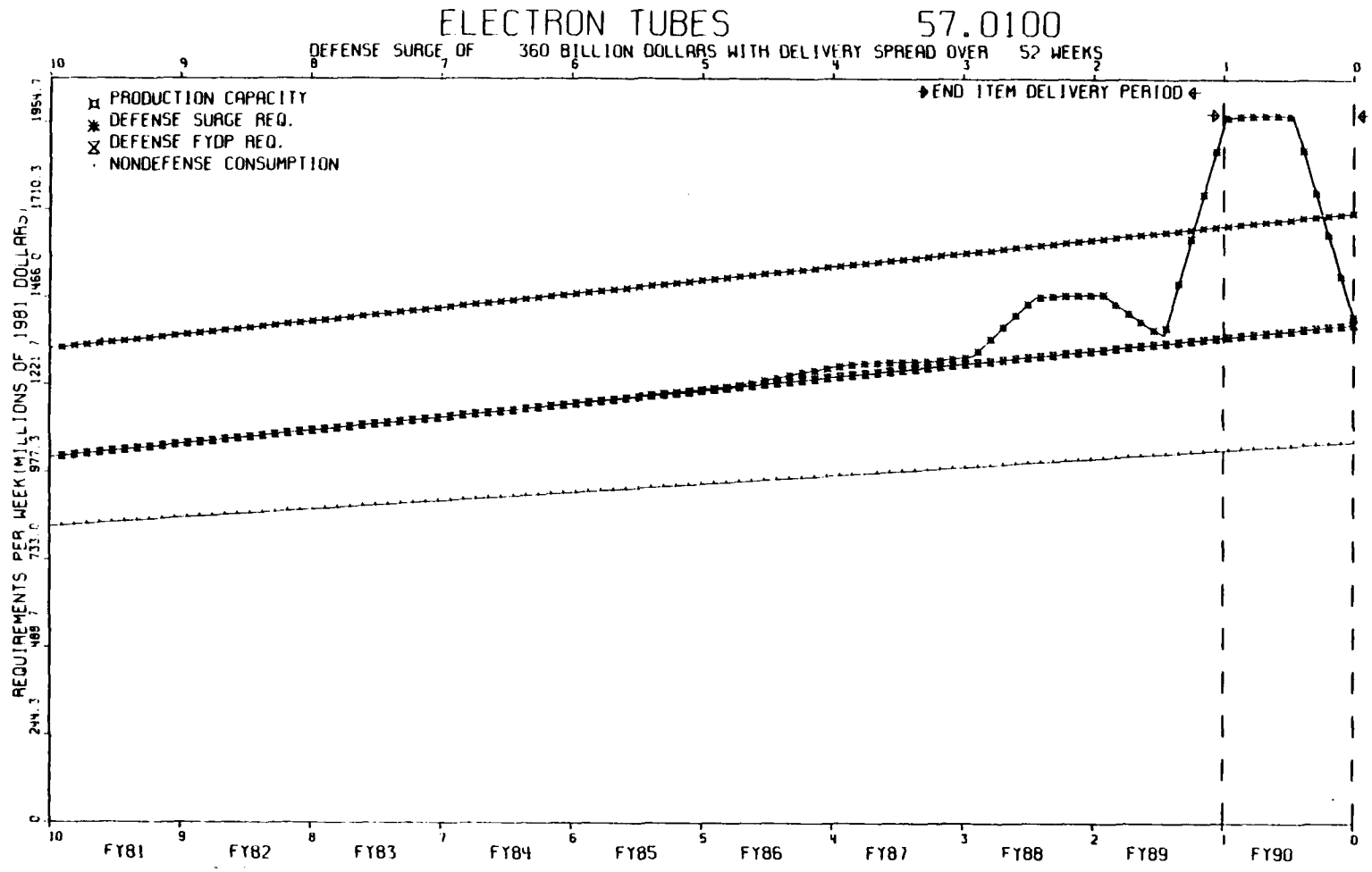
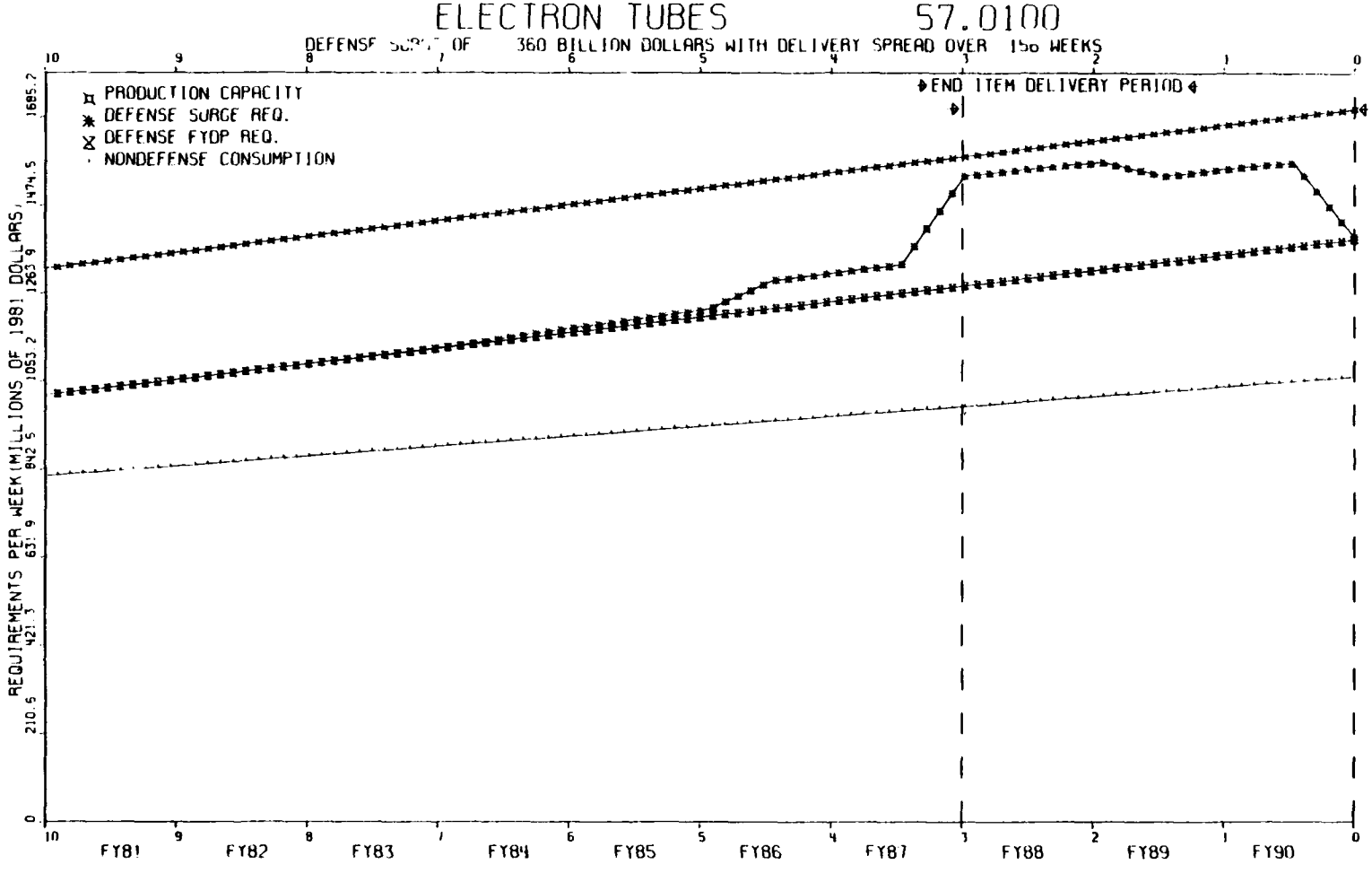
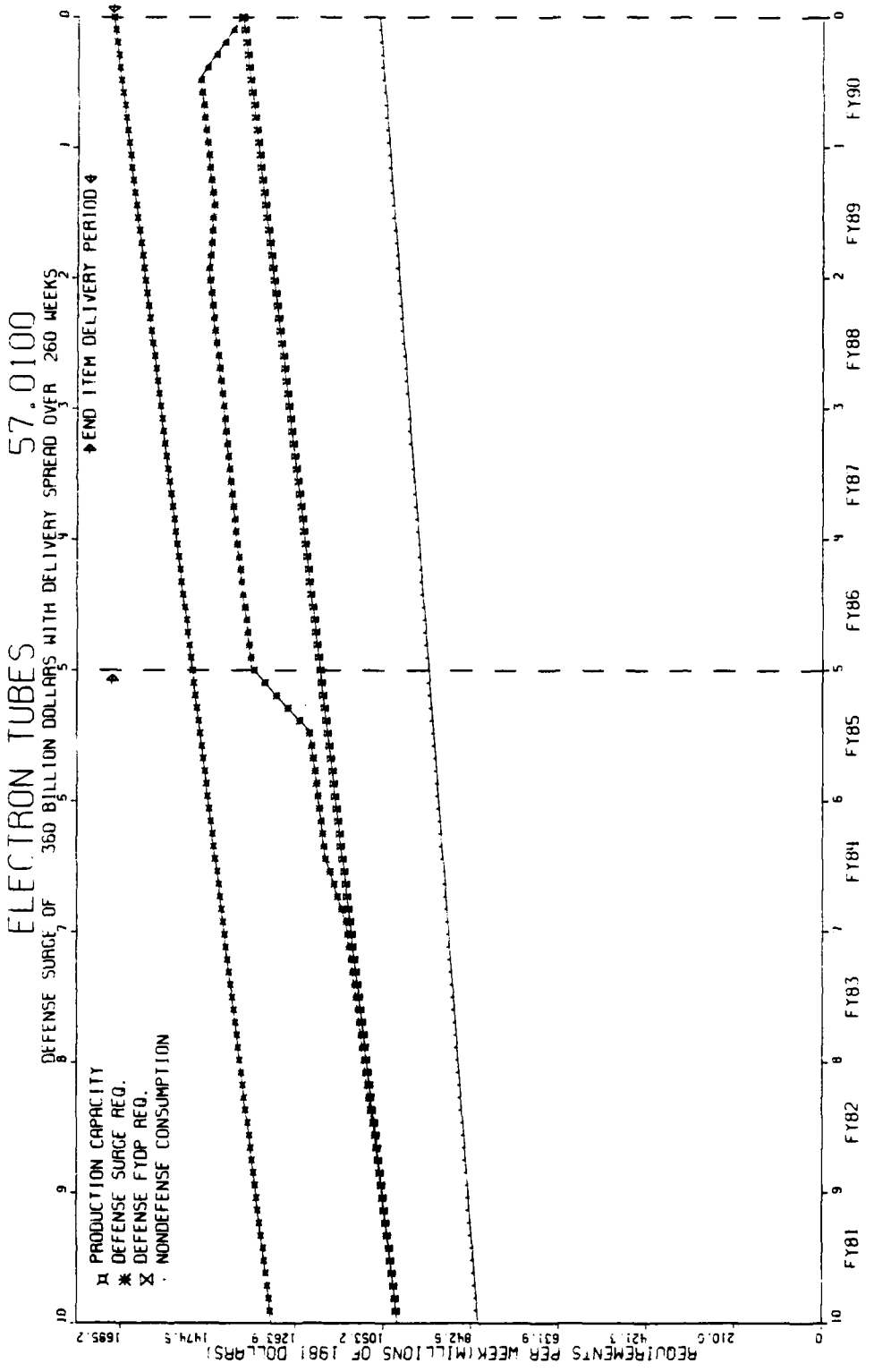
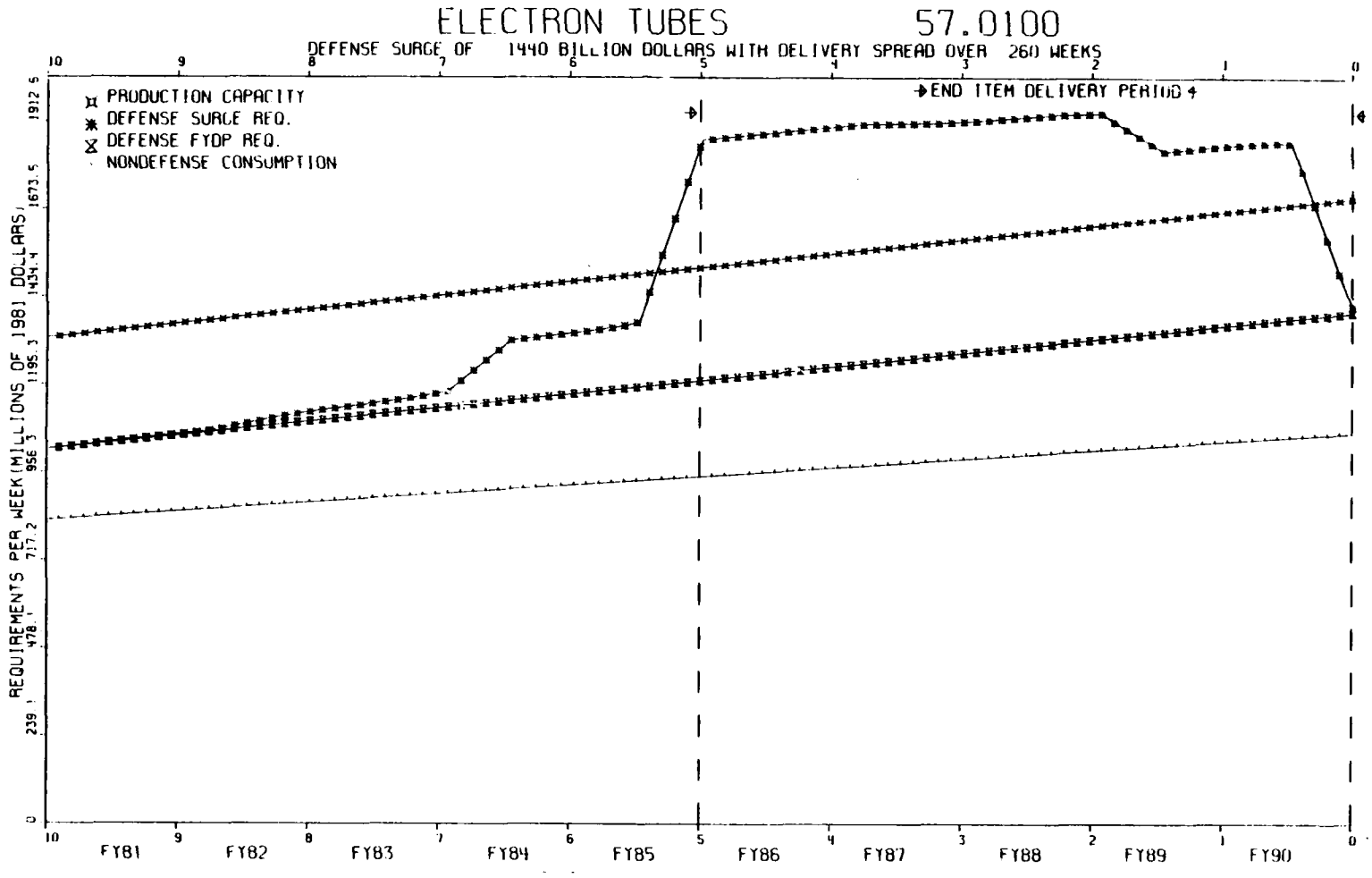
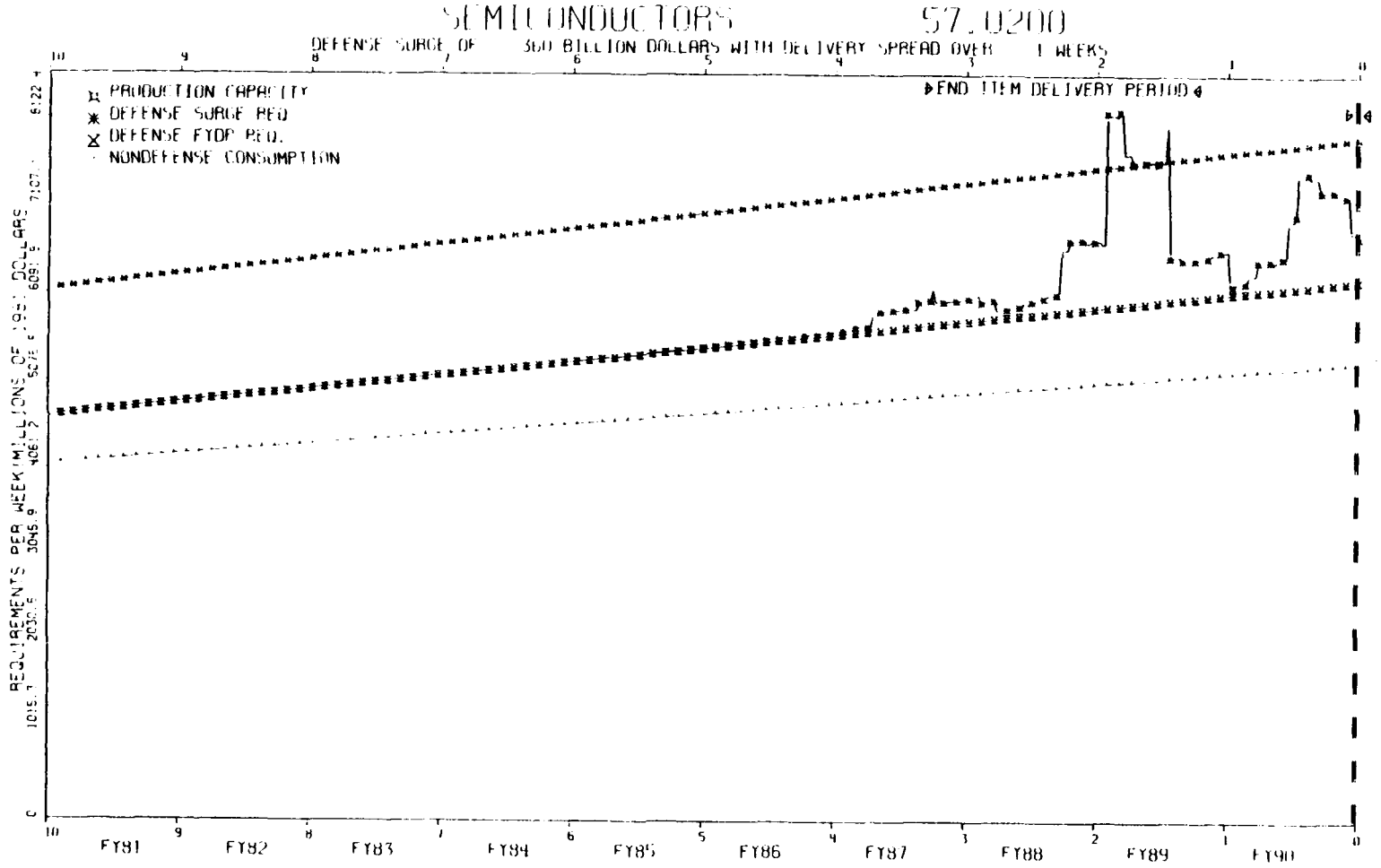
FY88
FY89
FY90

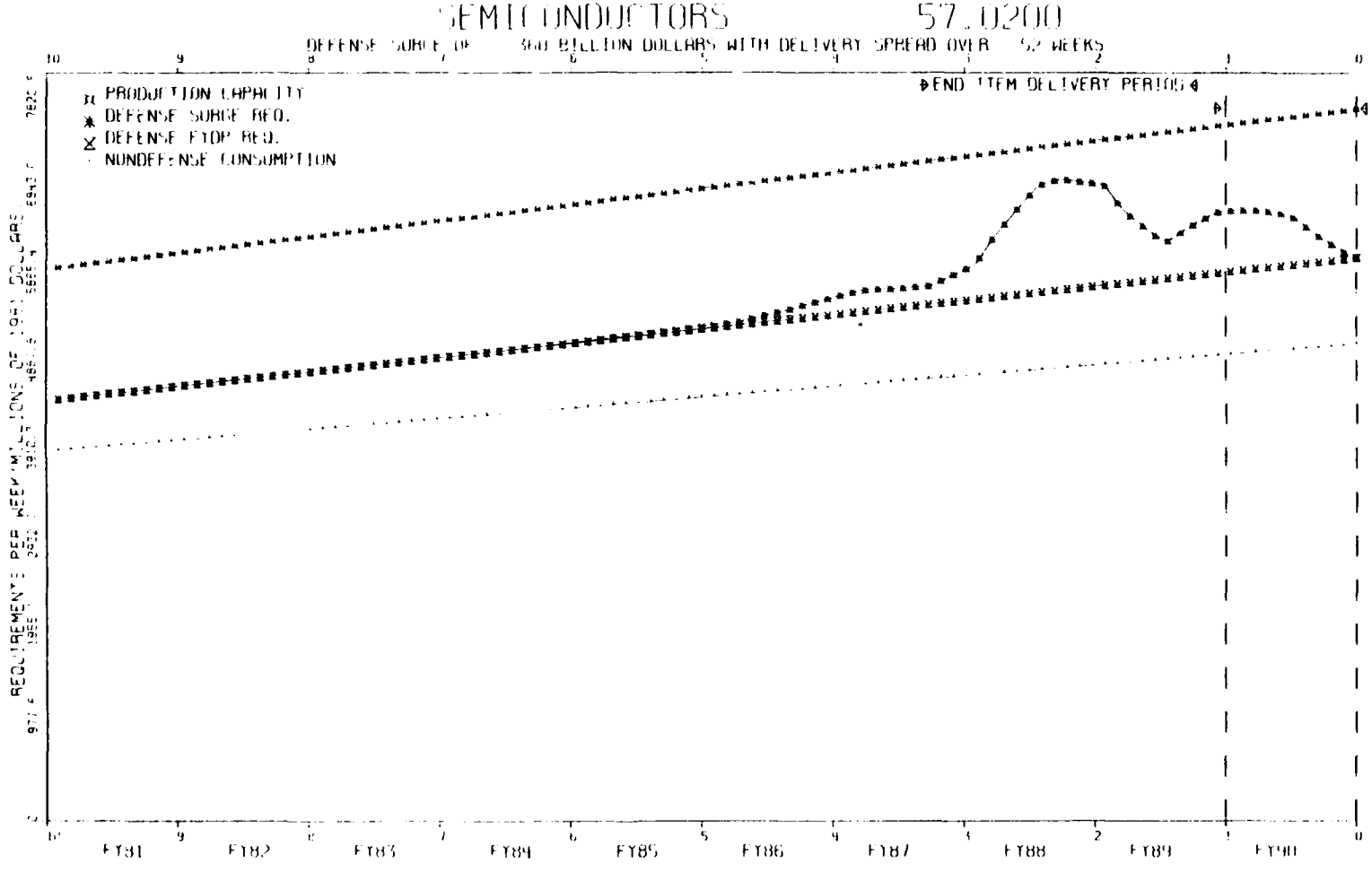

ELECTRON TUBES 57.0100
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
1954.7
1710.3
1466.0
1221.7
977.3
733.0
488.7
244.3
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

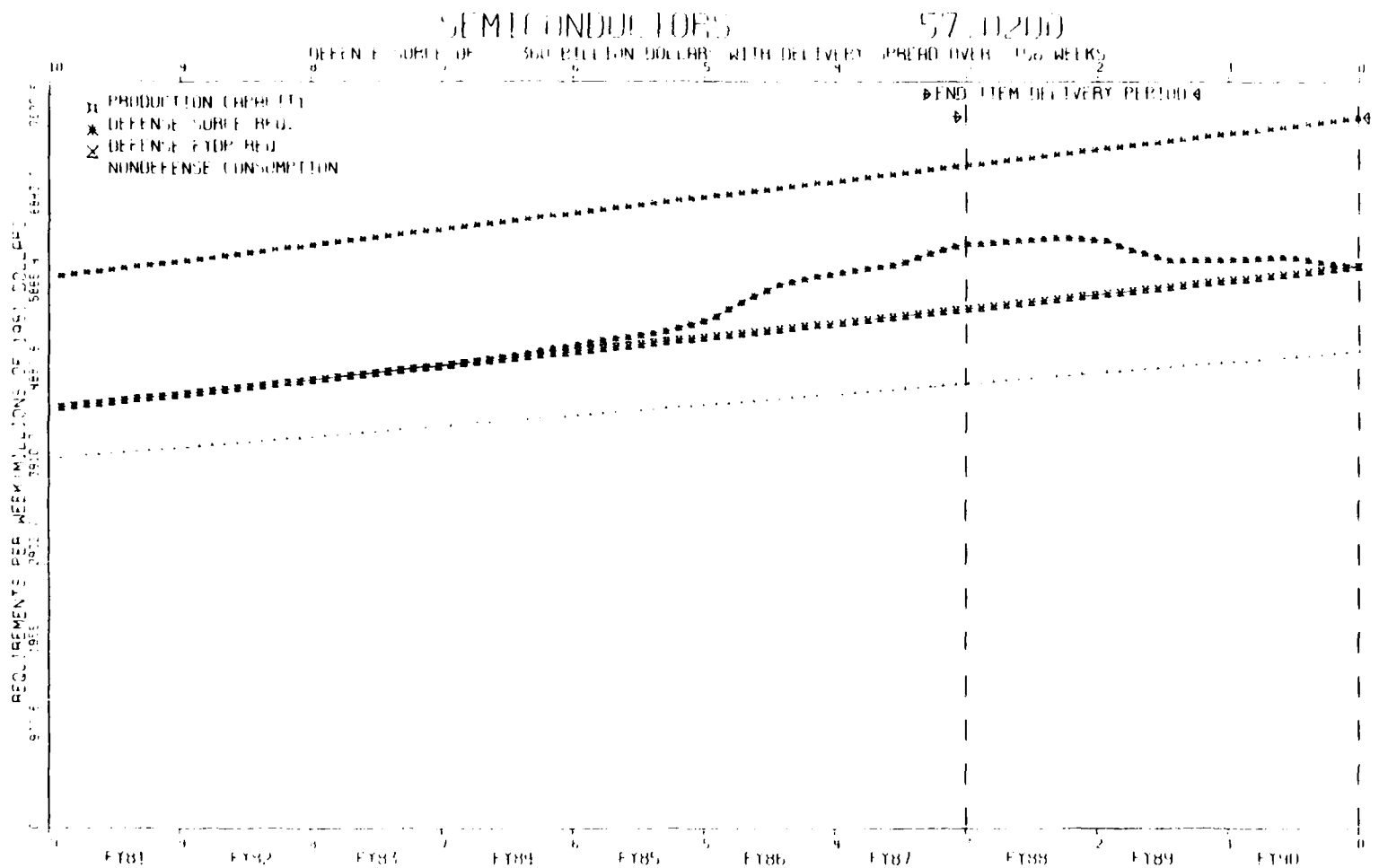

ELECTRON TUBES 57.0100
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
0
210.5
421.3
631.9
842.5
1053.2
1263.9
1474.5
1685.2
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90


ELECTRON TUBES 57.0100
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK(MILLIONS OF 1981 DOLLARS)
210.0
421.1
631.9
842.5
1053.2
1263.9
1474.5
1685.2
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90


ELECTRON TUBES 57.0100
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
1912.5
1673.5
1434.4
1195.3
956.3
717.2
478.1
239.1
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90


SEMICONDUCTORS 57.0200
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 1 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1982 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

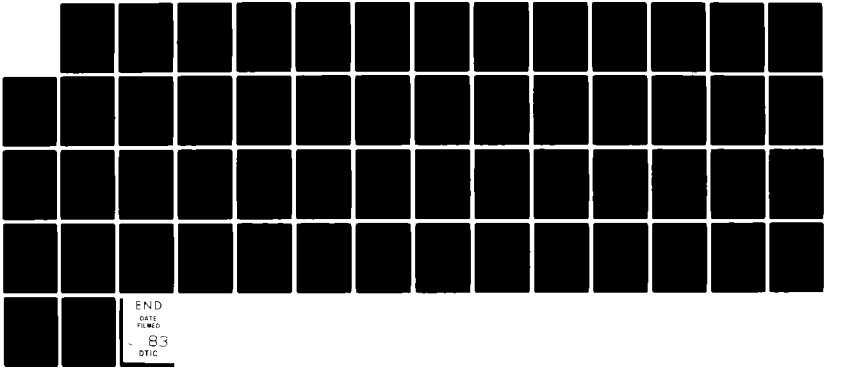

SEMICONDUCTORS 57.0200
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE STOP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK IN MILLIONS OF 1982 DOLLARS
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90


SEMICONDUCTORS
PRODUCTION CAPABILITY
DEFENSE SUBSEC REQ.
DEFENSE STOP REQ
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

AD-A123 871 A METHOD FOR CALCULATING INDUSTRIAL MOBILIZATION REQUIREMENTS WHICH INCOR..(U) INSTITUTE FOR DEFENSE ANALYSES ALEXANDRIA VA PROGRAM ANALYSIS.. P MCCOY

2/2

UNCLASSIFIED OCT 82 IDA-P-1632-VOL-2 F/G 15/5 NL



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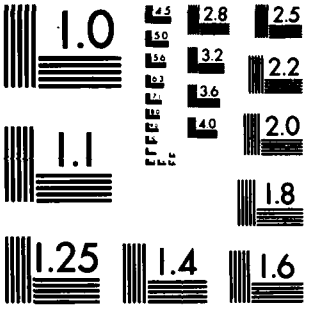
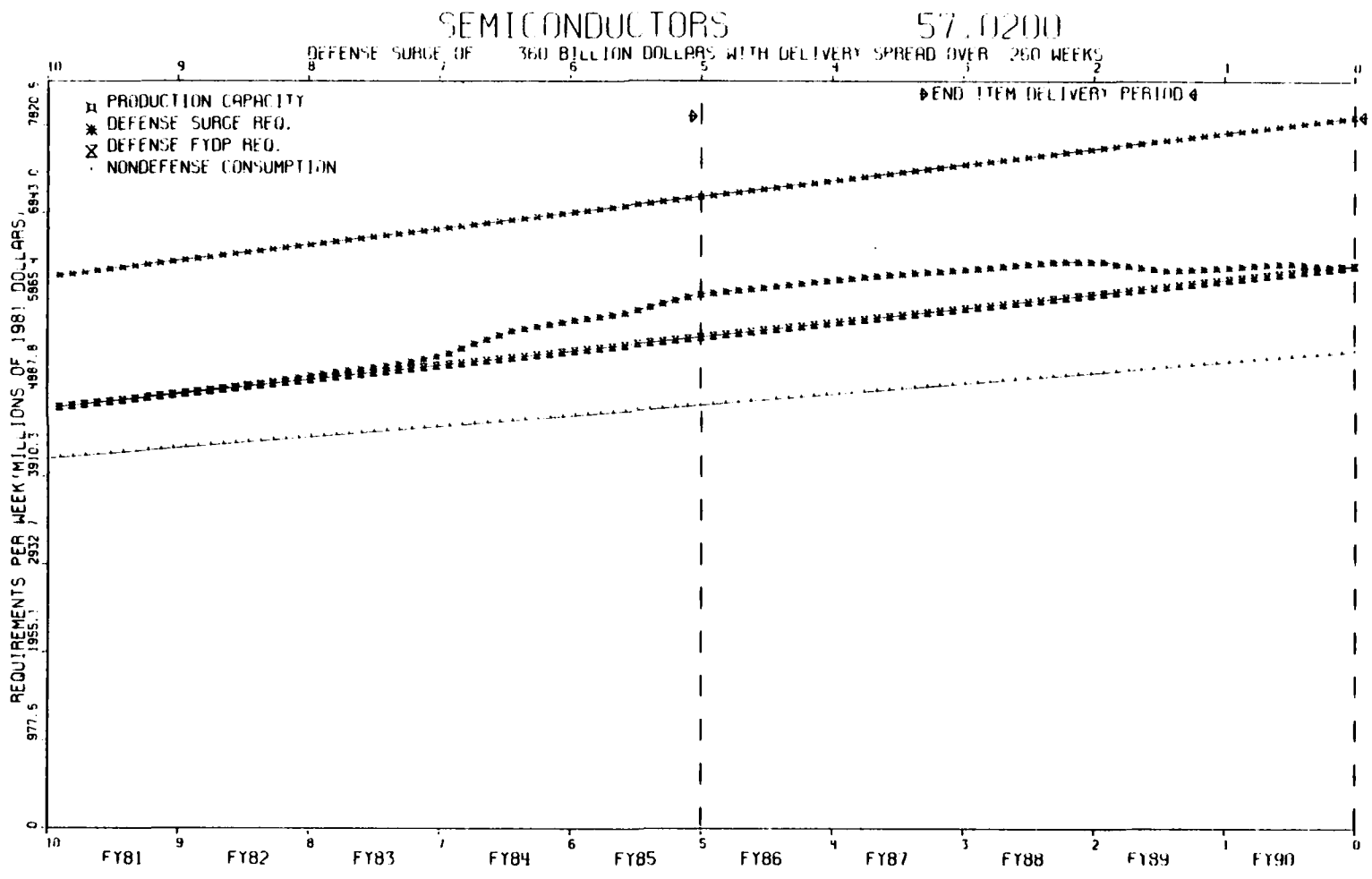
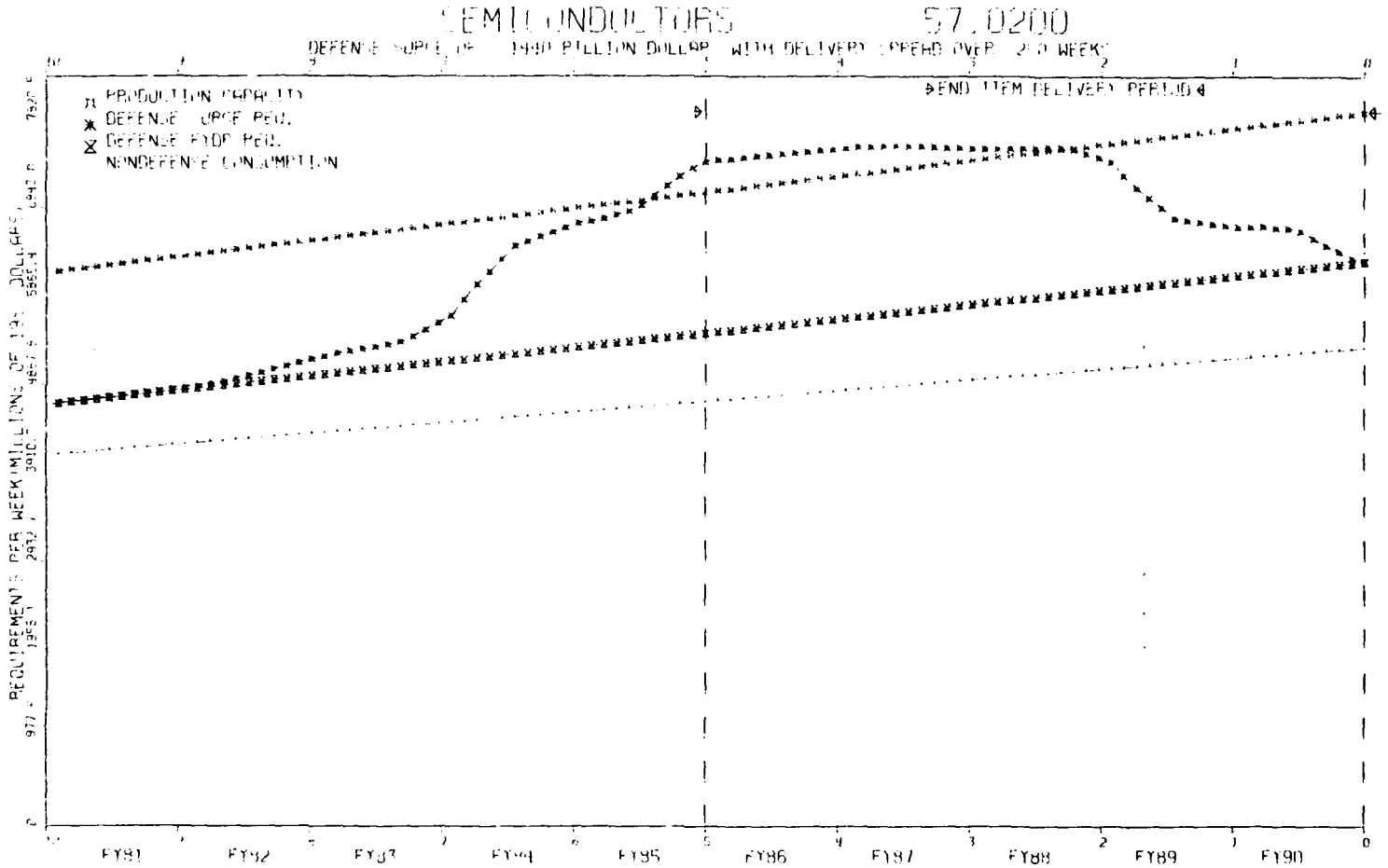
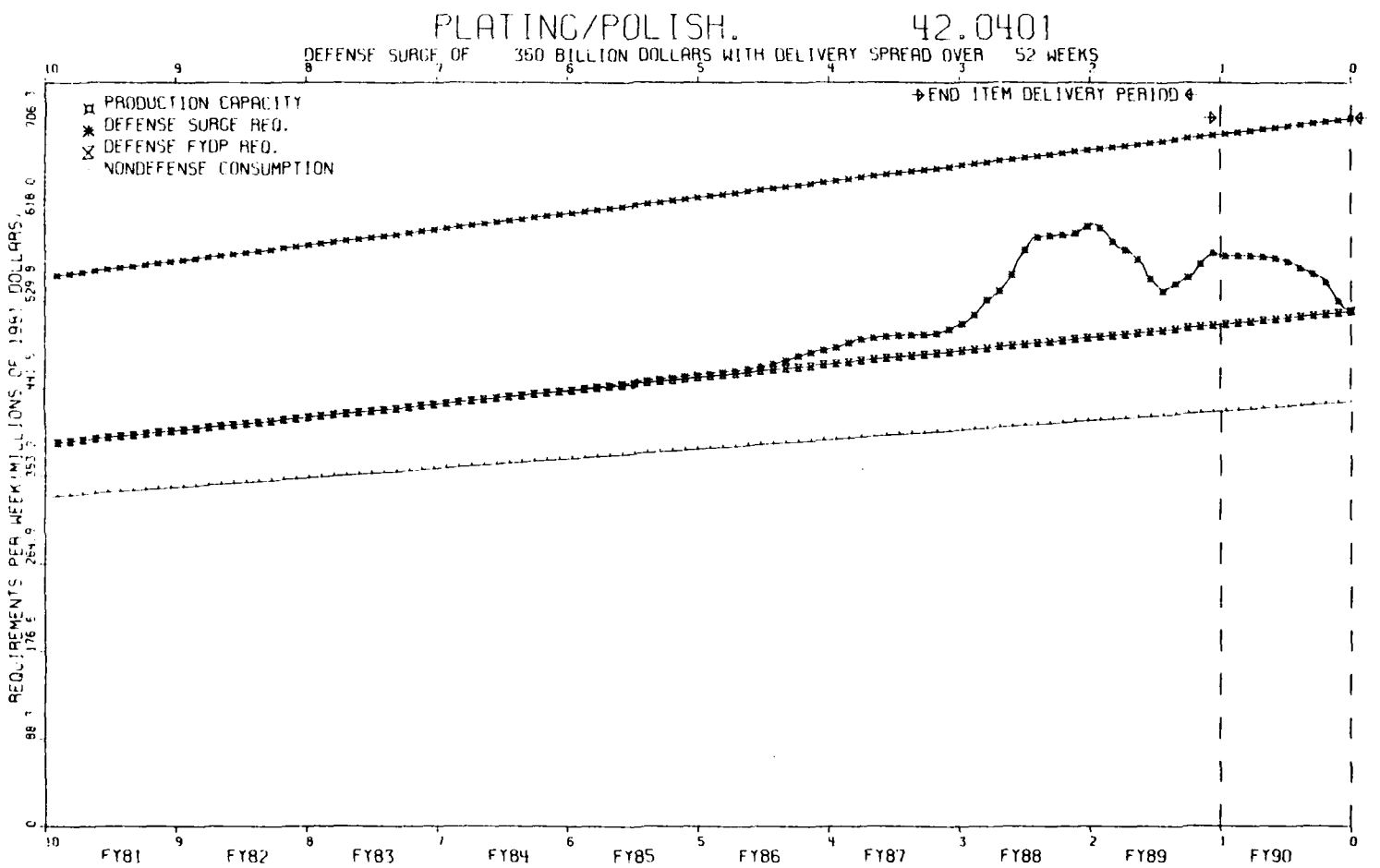


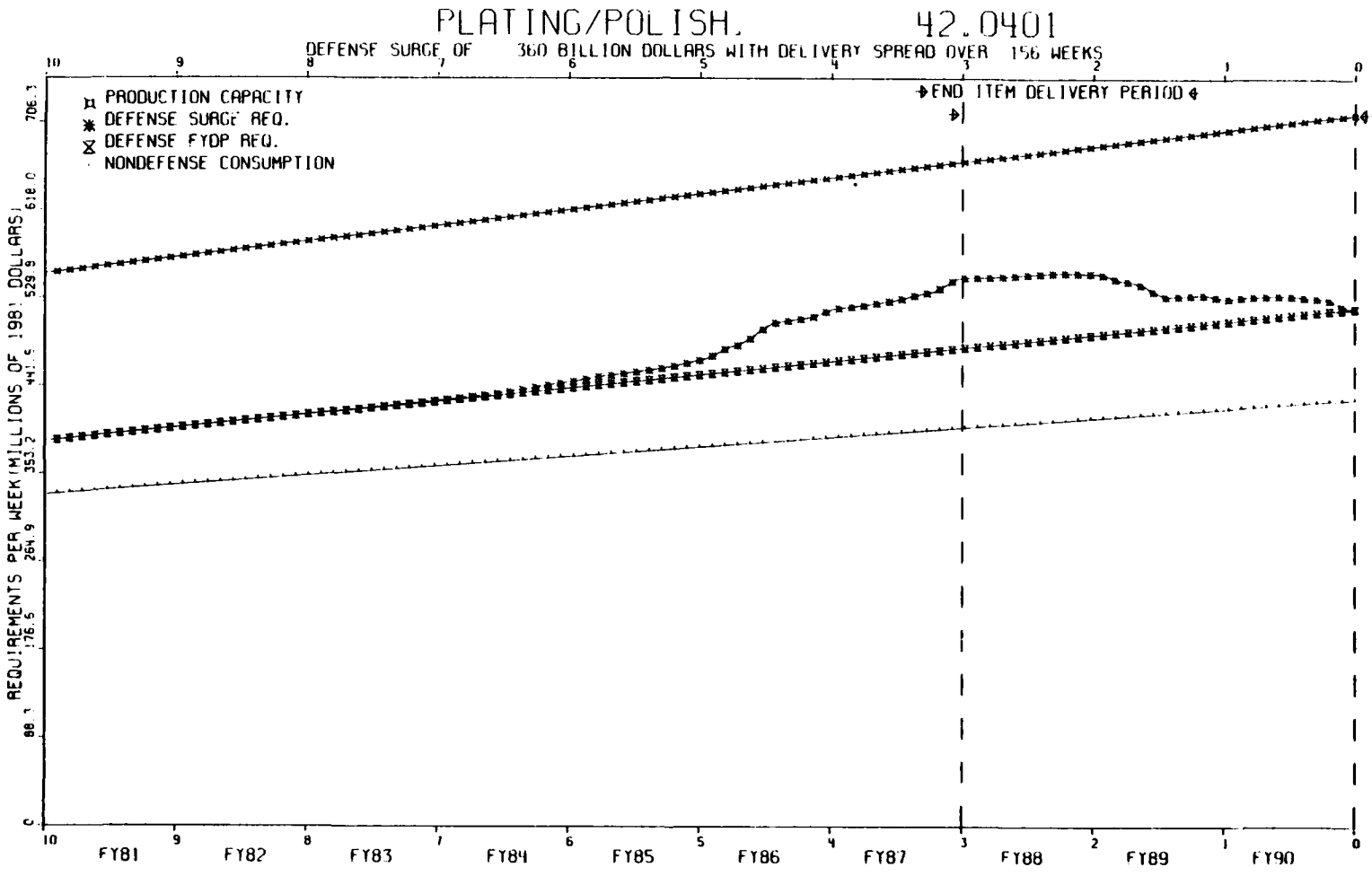
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A


SEMICONDUCTORS 57.0200
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
7820.5
6843.0
5865.4
4887.8
3910.3
2932.7
1955.1
977.5
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90


SEMICONDUCTORS 57.0200
DEFENSE SUPPLY OF 1990 BILLION DOLLAR WITH DELIVERY SPEED OVER 2.0 WEEKS
PRODUCTION CAPACITY
DEFENSE UPDF REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 19
DOLLARS
FY91
FY92
FY93
FY94
FY95
FY86
FY87
FY88
FY89
FY90

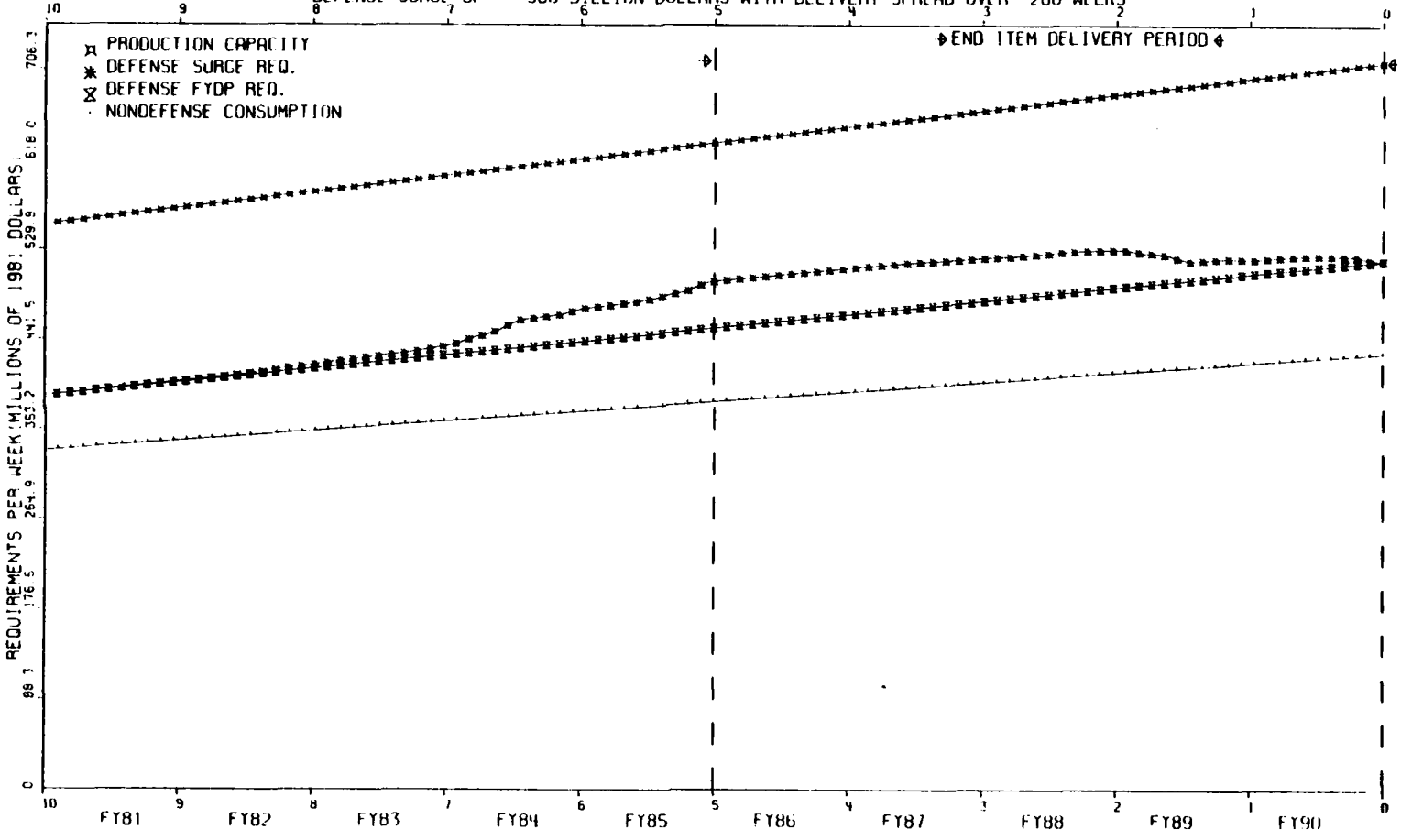

PLATING/POLISH. 42.0401
DEFENSE SURGE OF 350 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK IN MILLIONS OF 1981 DOLLARS
706.1
618.0
529.9
441.8
353.8
264.9
176.8
88.7
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

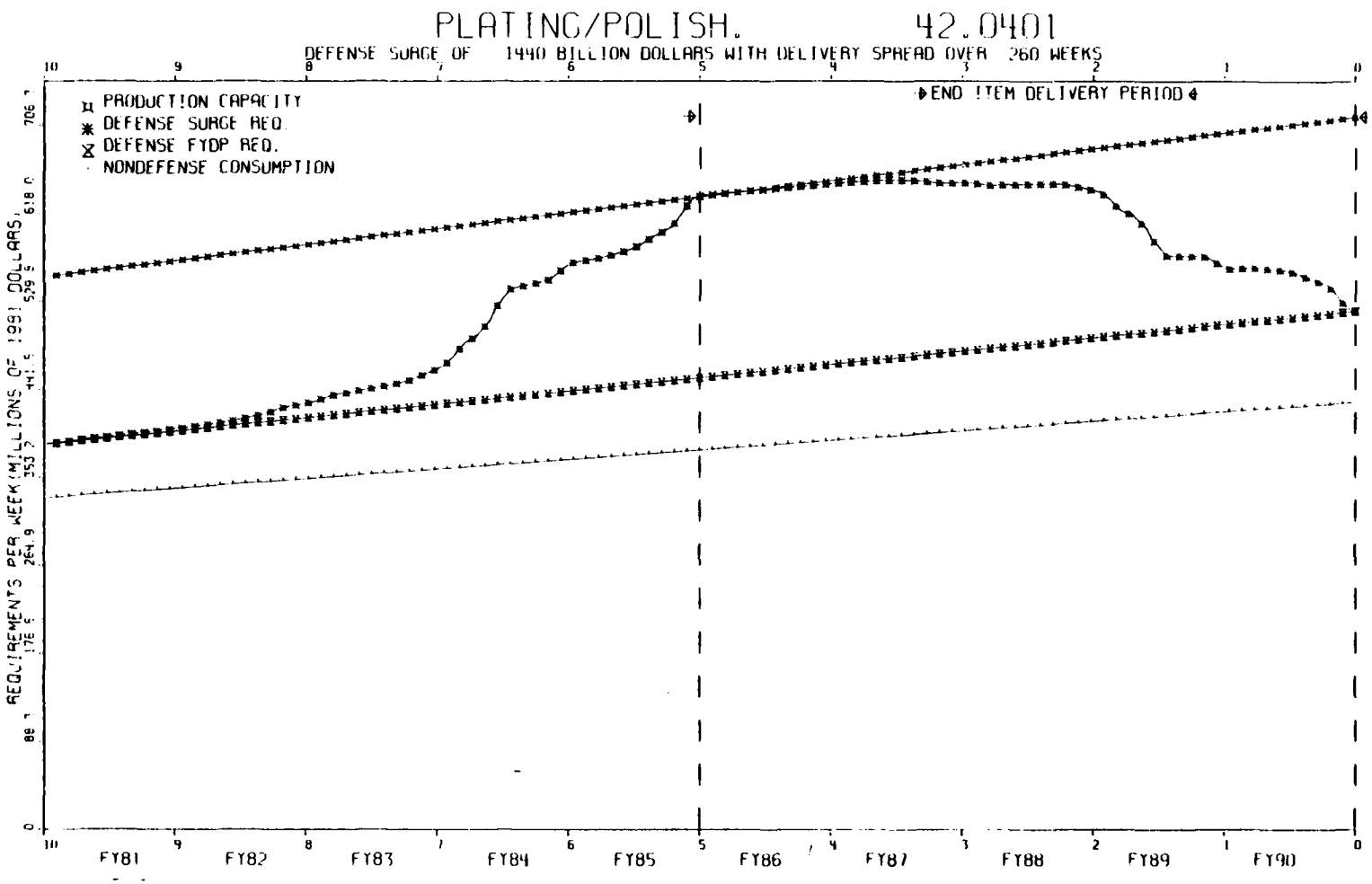
C11-3

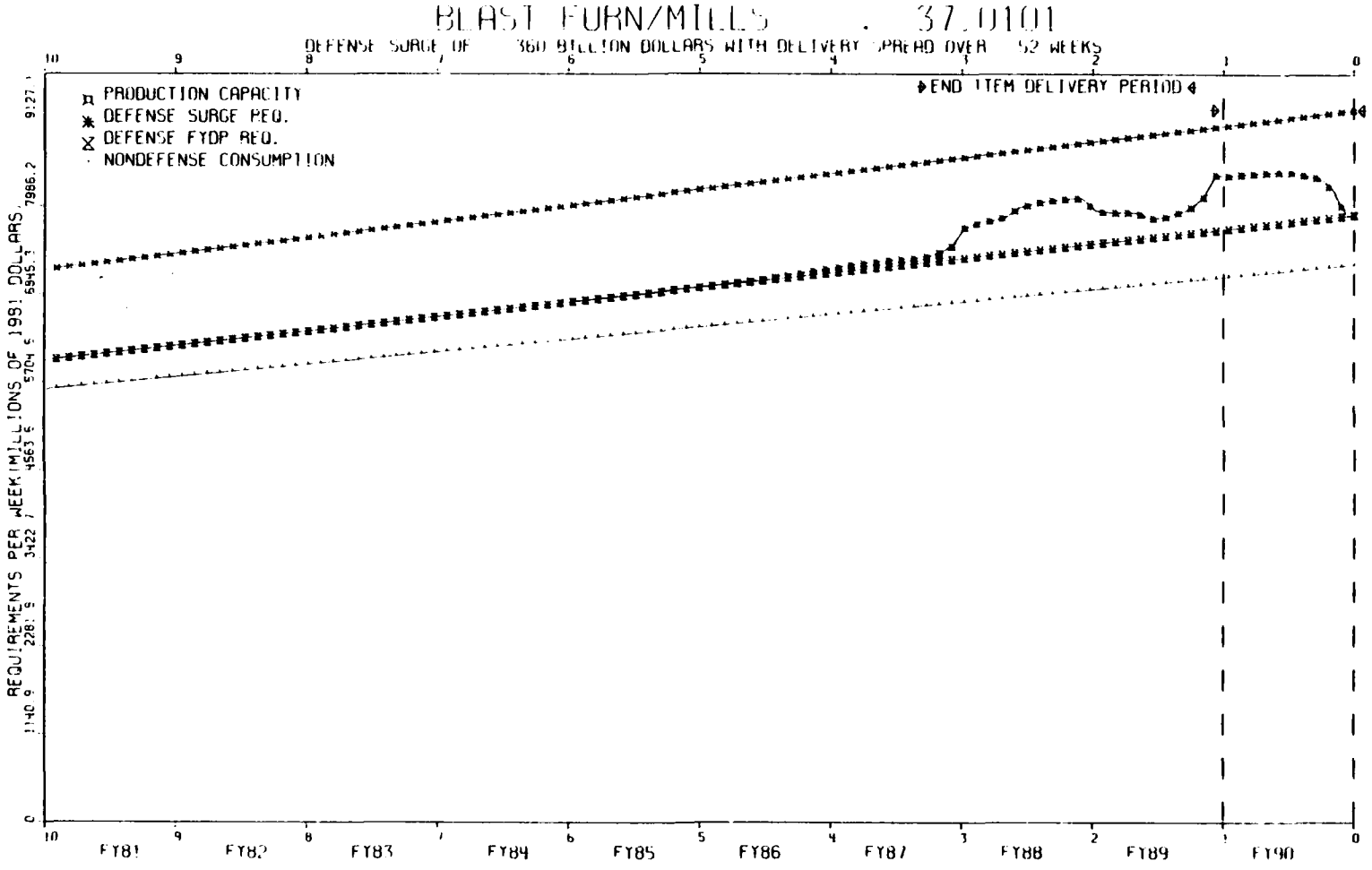

PLATING/POLISH. 42.0401
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
706.3
618.0
529.9
441.6
353.2
264.9
176.5
88.1
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

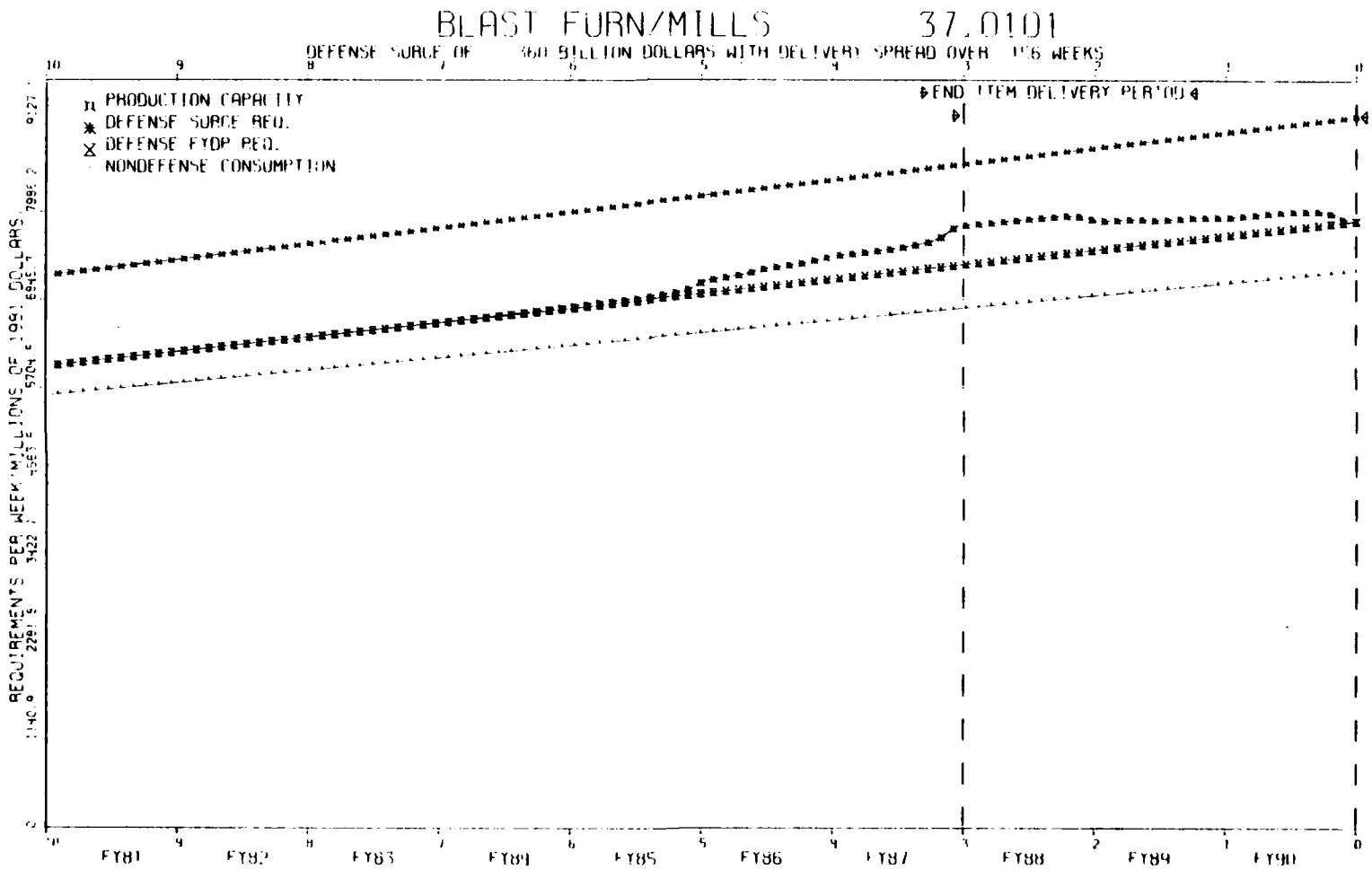
PLATING/POLISH. 42.0401

DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS




PLATING/POLISH. 42.0401
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
706.1
618.0
529.9
441.8
353.7
264.9
176.8
88.7
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90


BLAST FURN/MILLS . 37.0101
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK IN MILLIONS OF 1981 DOLLARS
0
1140.9
2281.9
3422.7
4563.6
5704.6
6845.5
7986.2
9127.1
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90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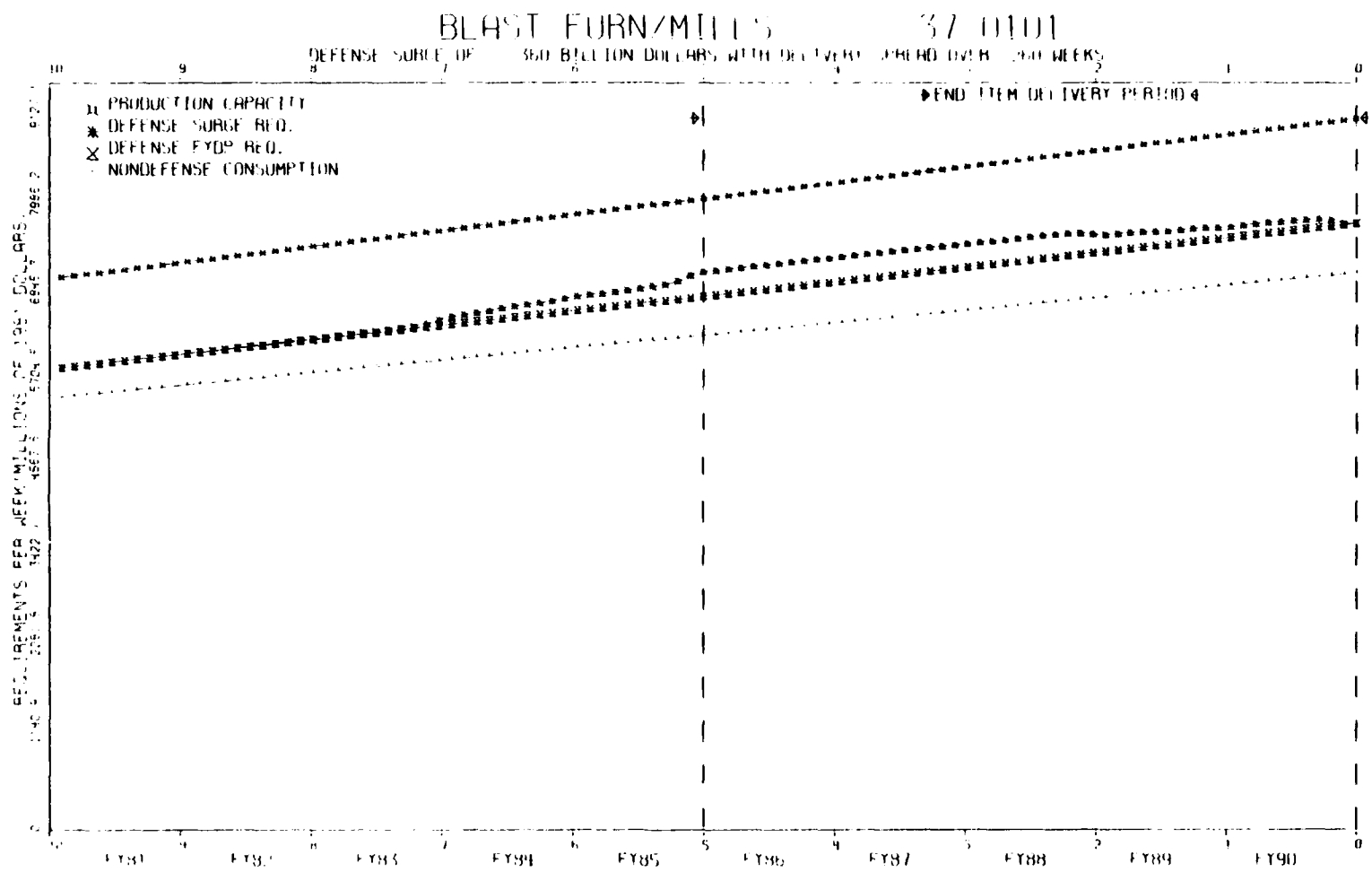
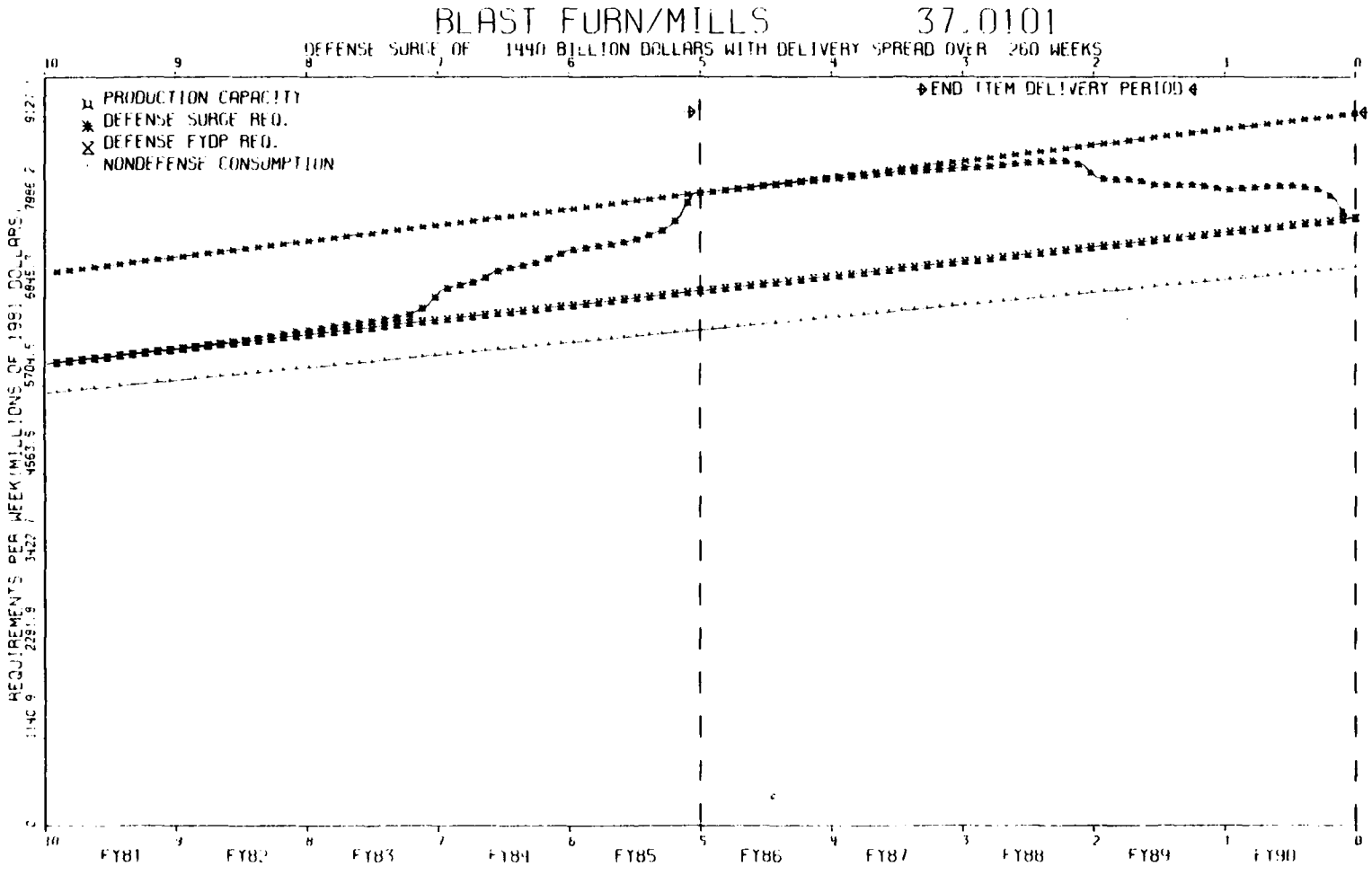
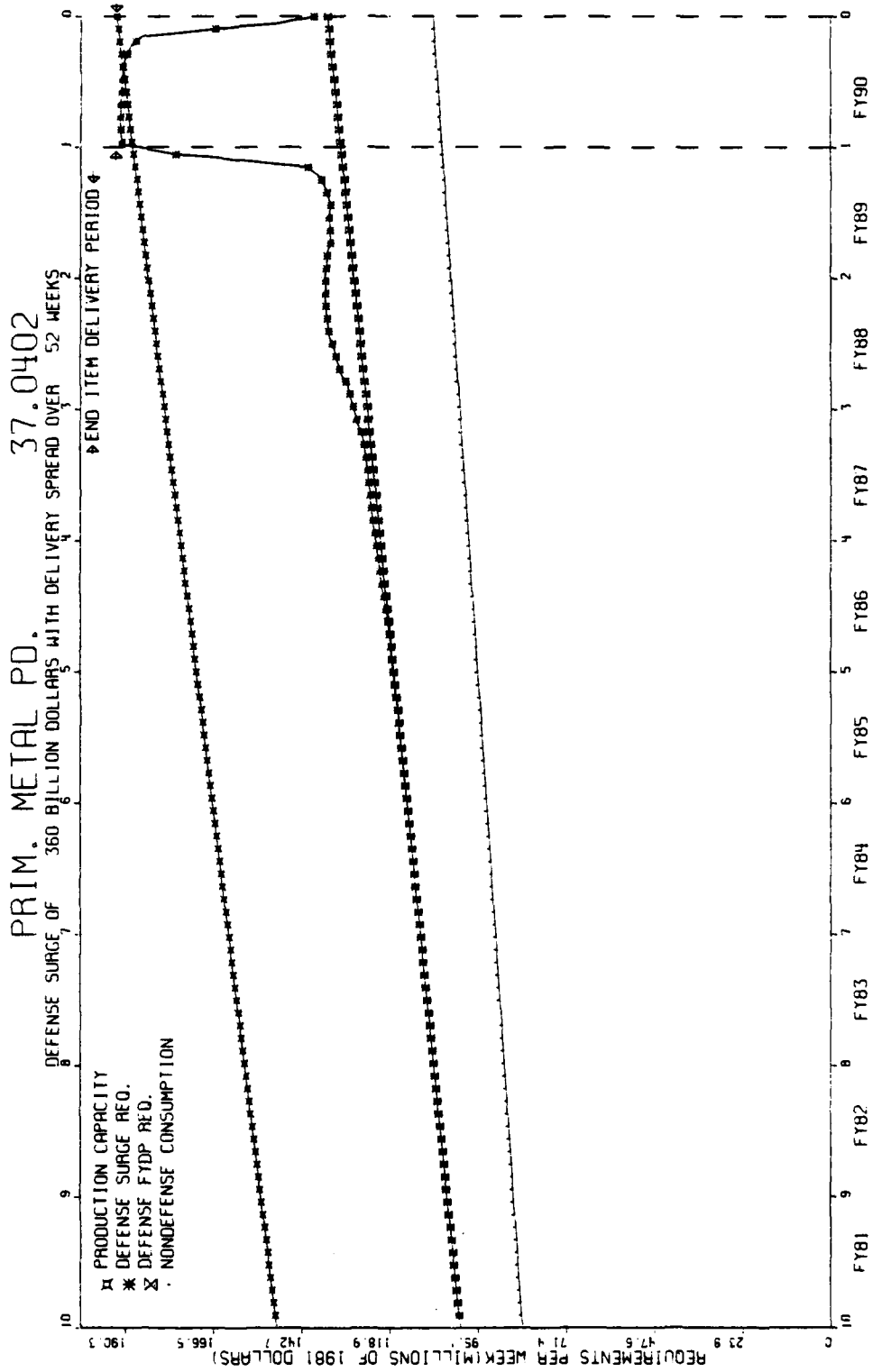
DEFENSE SURGE OF $60 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1991 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90


BLAST FURN/MILLS
DEFENSE SURGE OF
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
FY91
FY90
FY89
FY88
FY87
FY86
FY85


BLAST FURN/MILLS 37.0101
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90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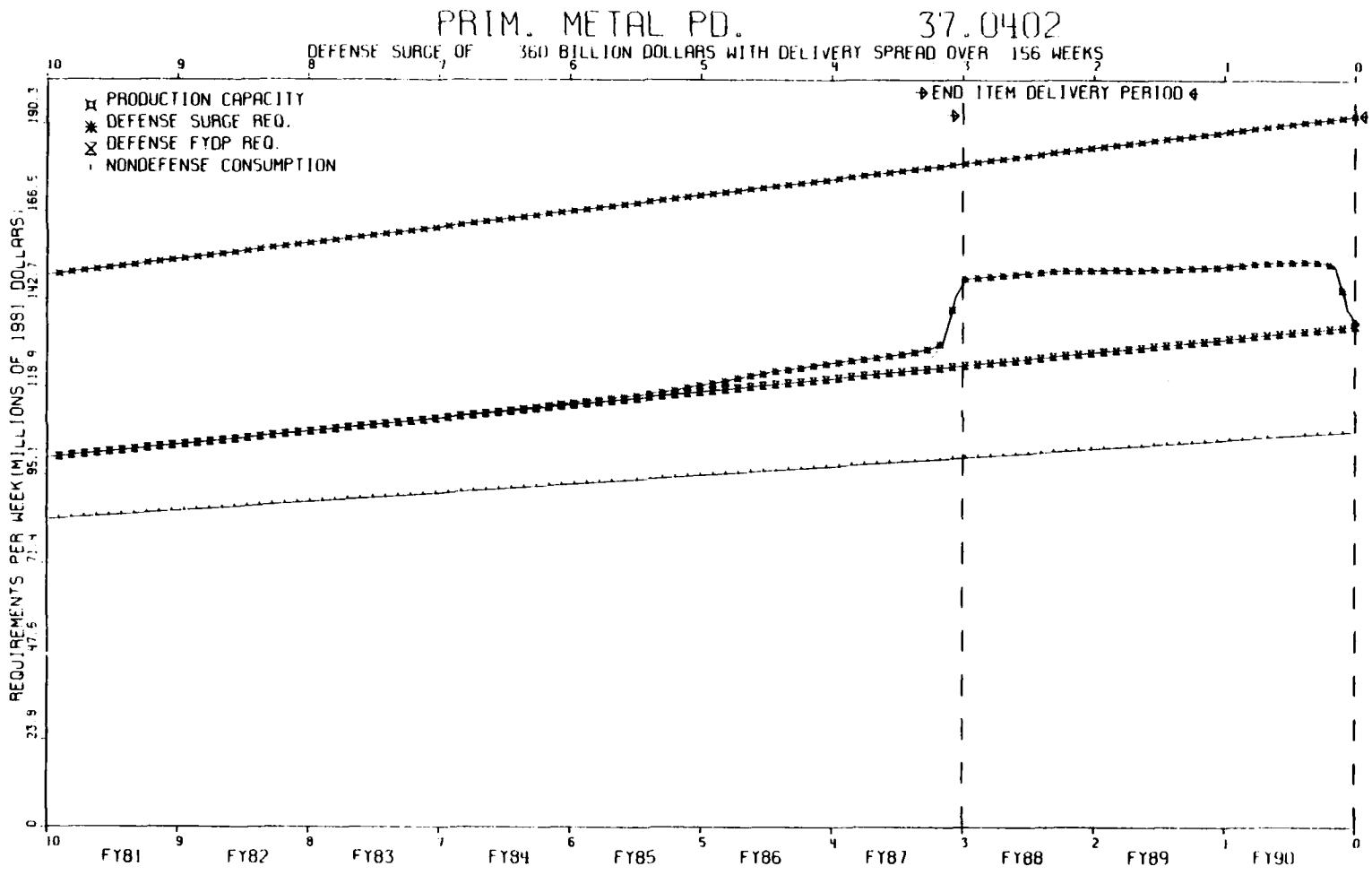
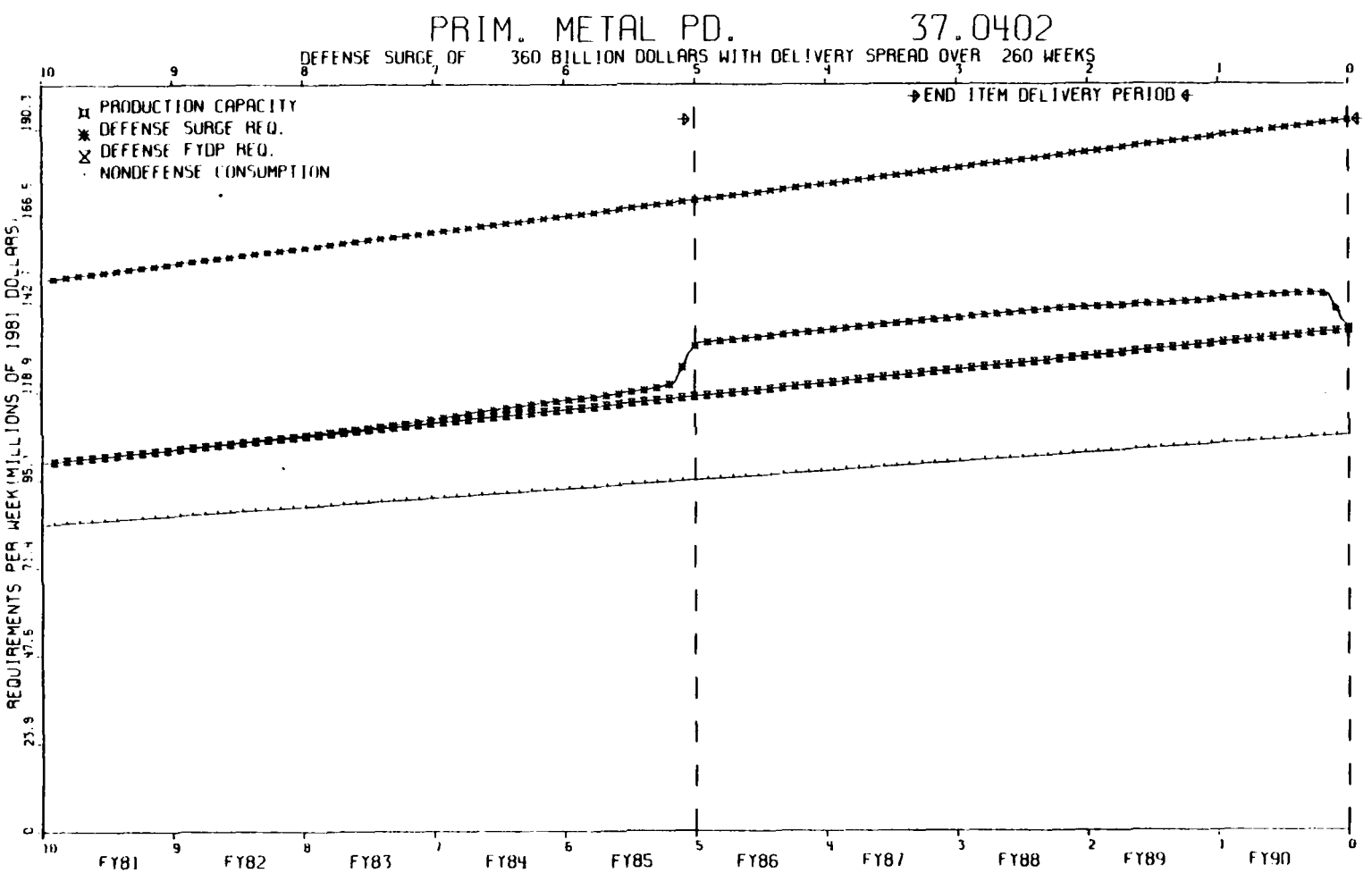
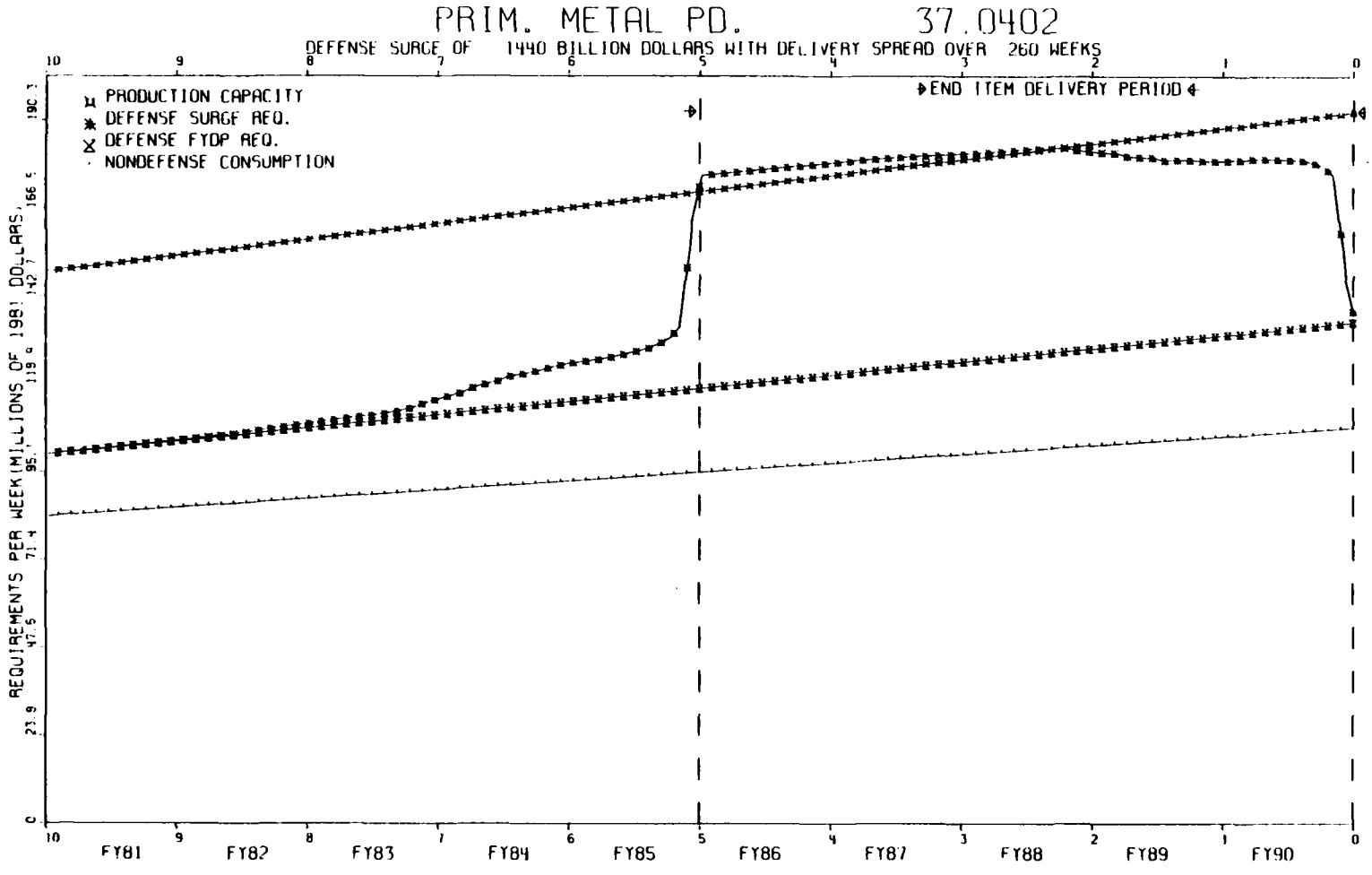
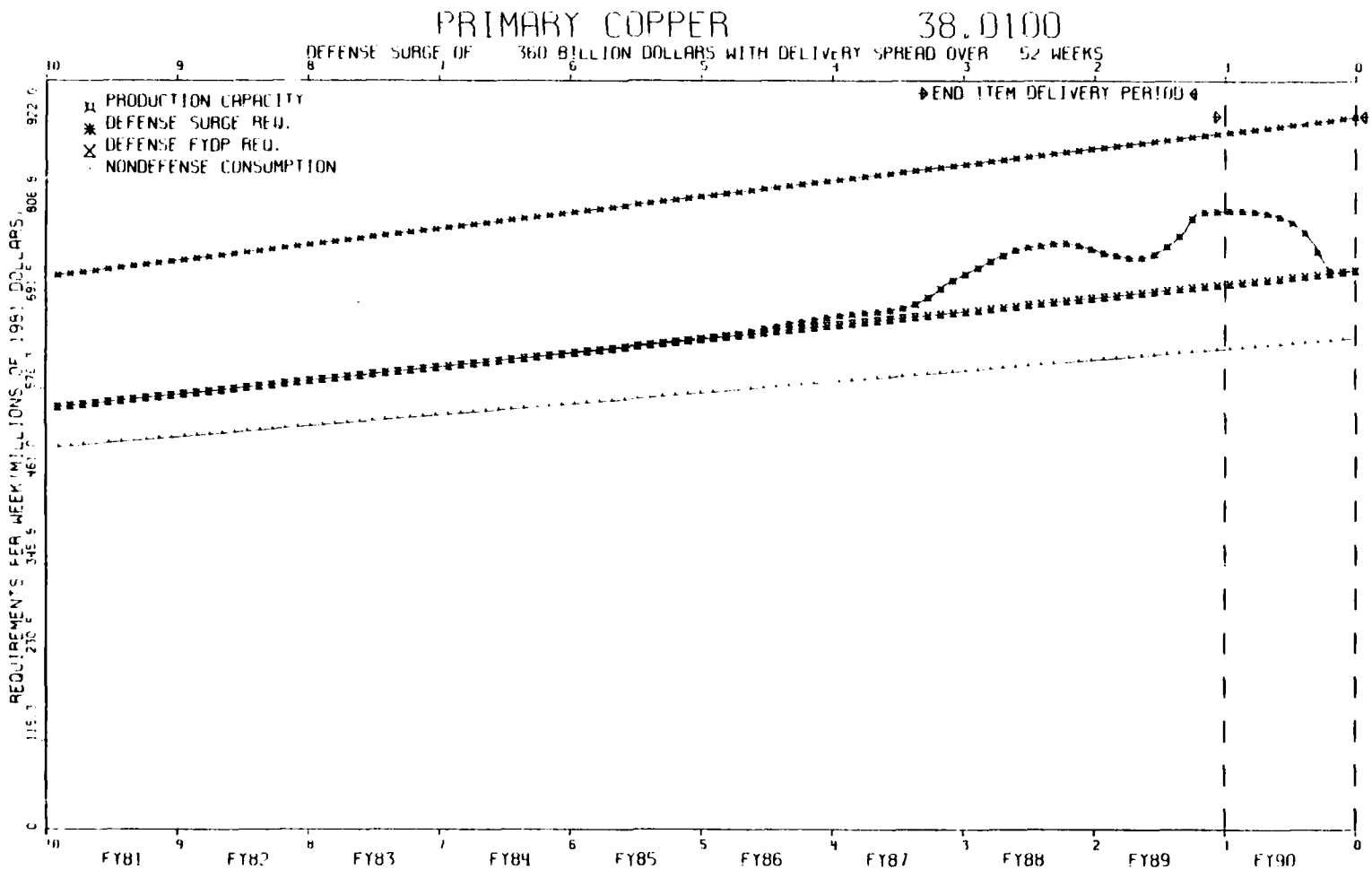
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK(MILLIONS OF 1981 DOLLARS)
190.3
166.5
142.7
118.9
95.1
71.4
47.6
23.9
0
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90


PRIM. METAL PD. 37.0402
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK(MILLIONS OF 1981 DOLLARS)
190.3
166.5
142.7
118.9
95.1
71.4
47.6
23.9
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90


PRIM. METAL PD. 37.0402
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
10 9 8 7 6 5 4 3 2 1 0
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
190.7
166.8
142.
118.9
95.
71.4
47.6
23.9
0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90


PRIM. METAL PD. 37.0402
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
10 9 8 7 6 5 4 3 2 1 0
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK(MILLIONS OF 1981 DOLLARS)
190.3
166.5
142.7
119.0
95.1
71.4
47.5
23.8
0
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90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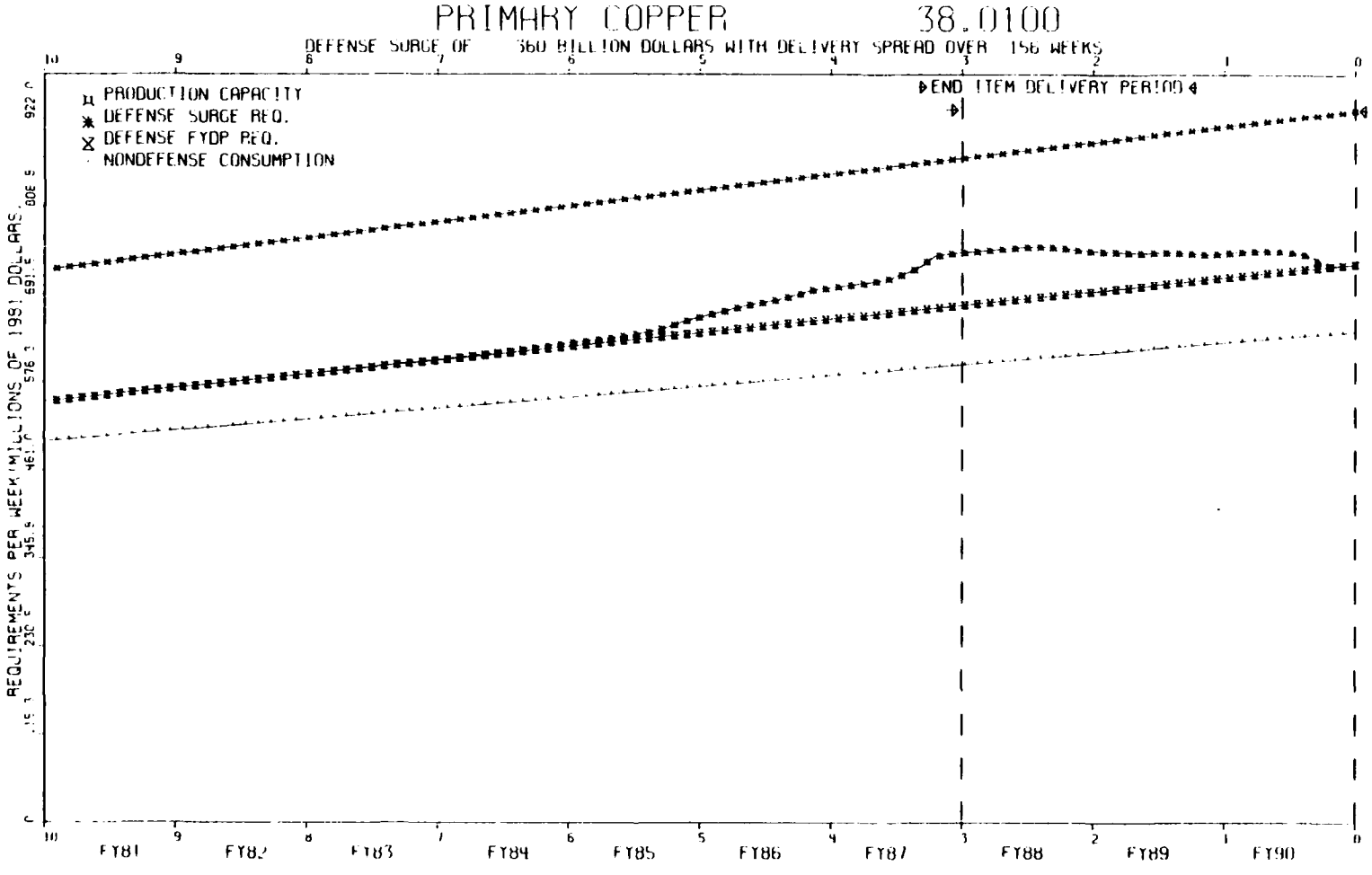
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1958 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90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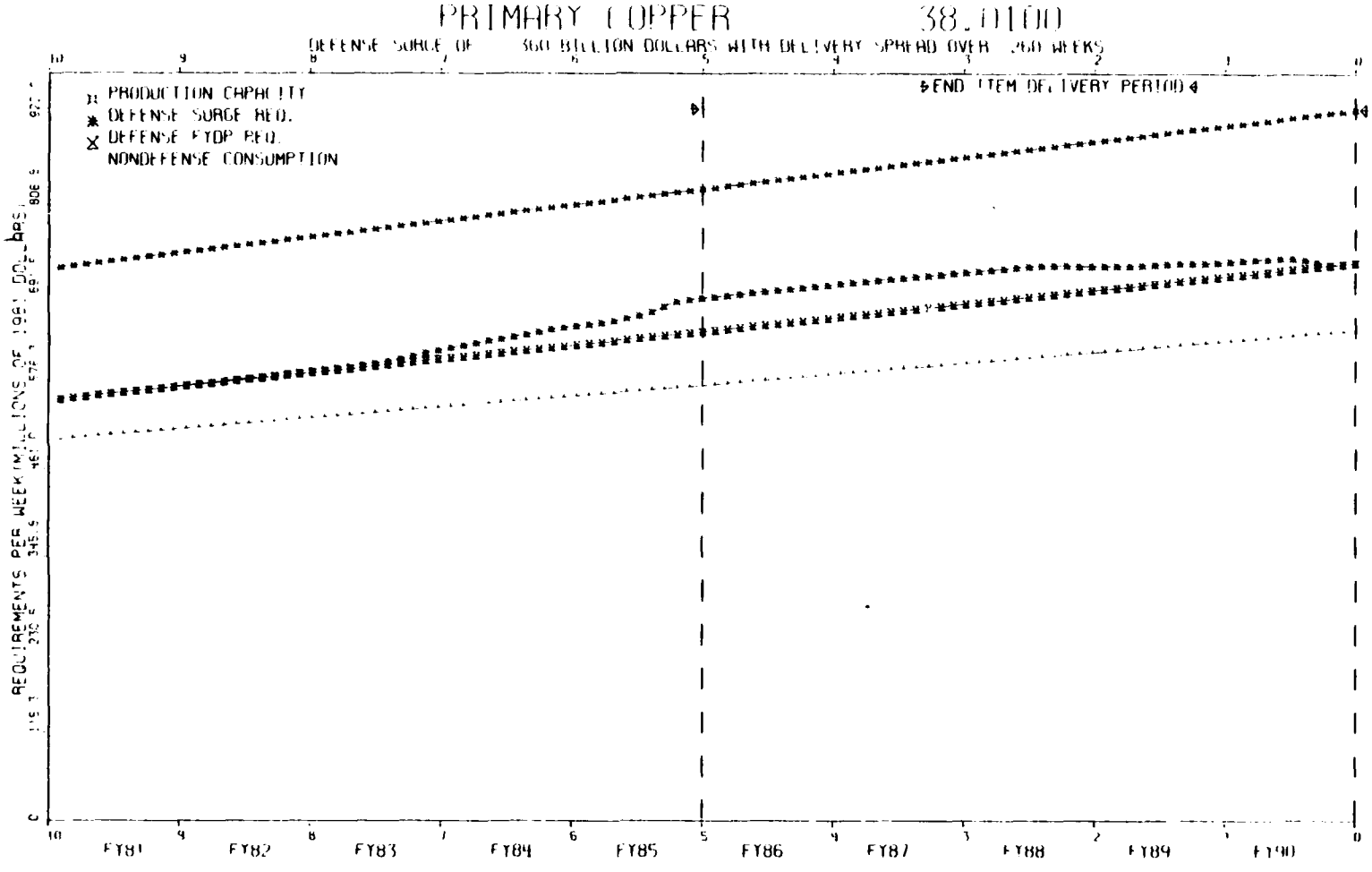
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
922.0
806.5
691.5
576.3
461.0
345.8
230.5
115.3
0
10
9
8
7
6
5
4
3
2
1
0
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90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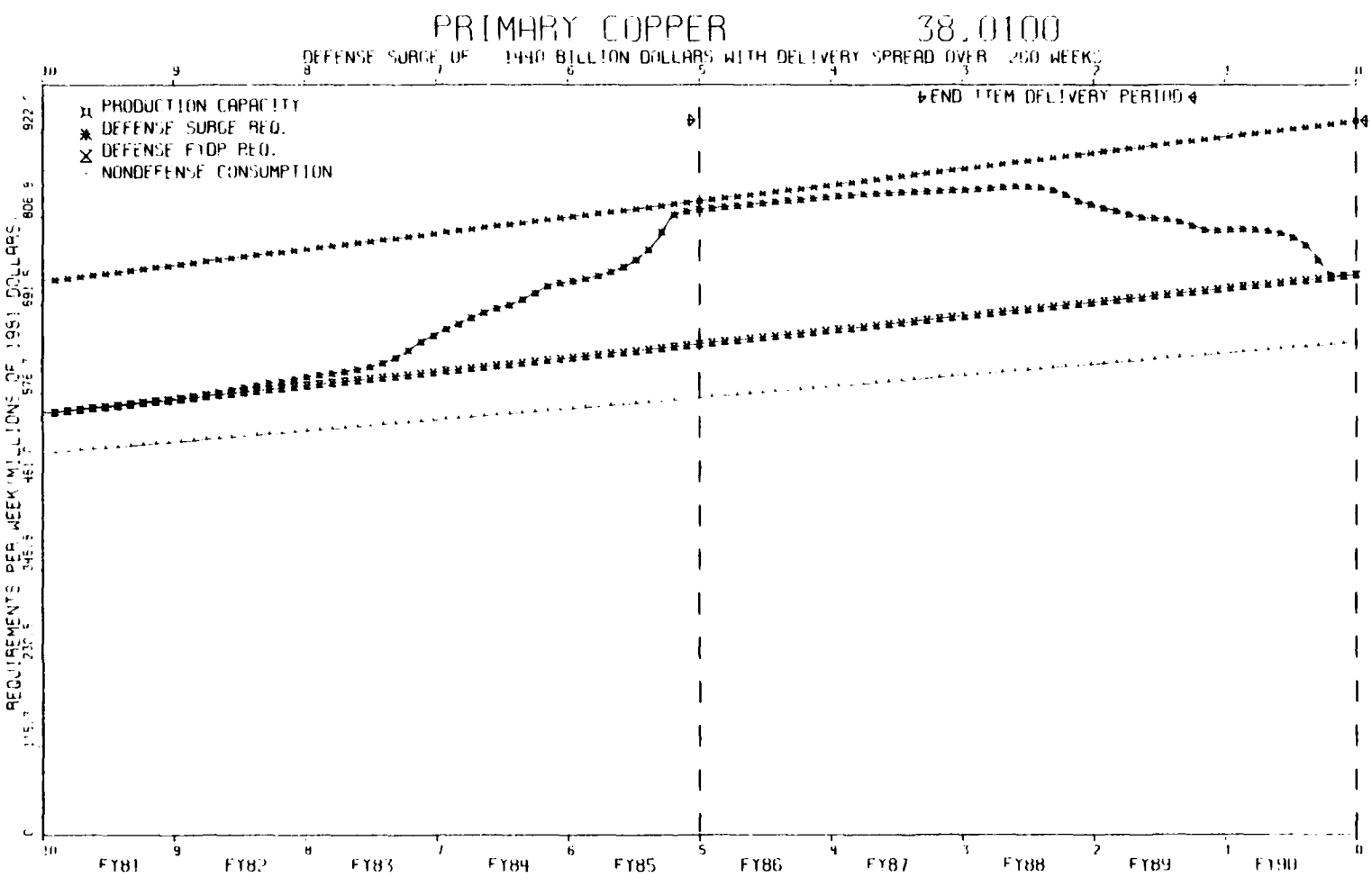
DEFENSE SURGE OF 500 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90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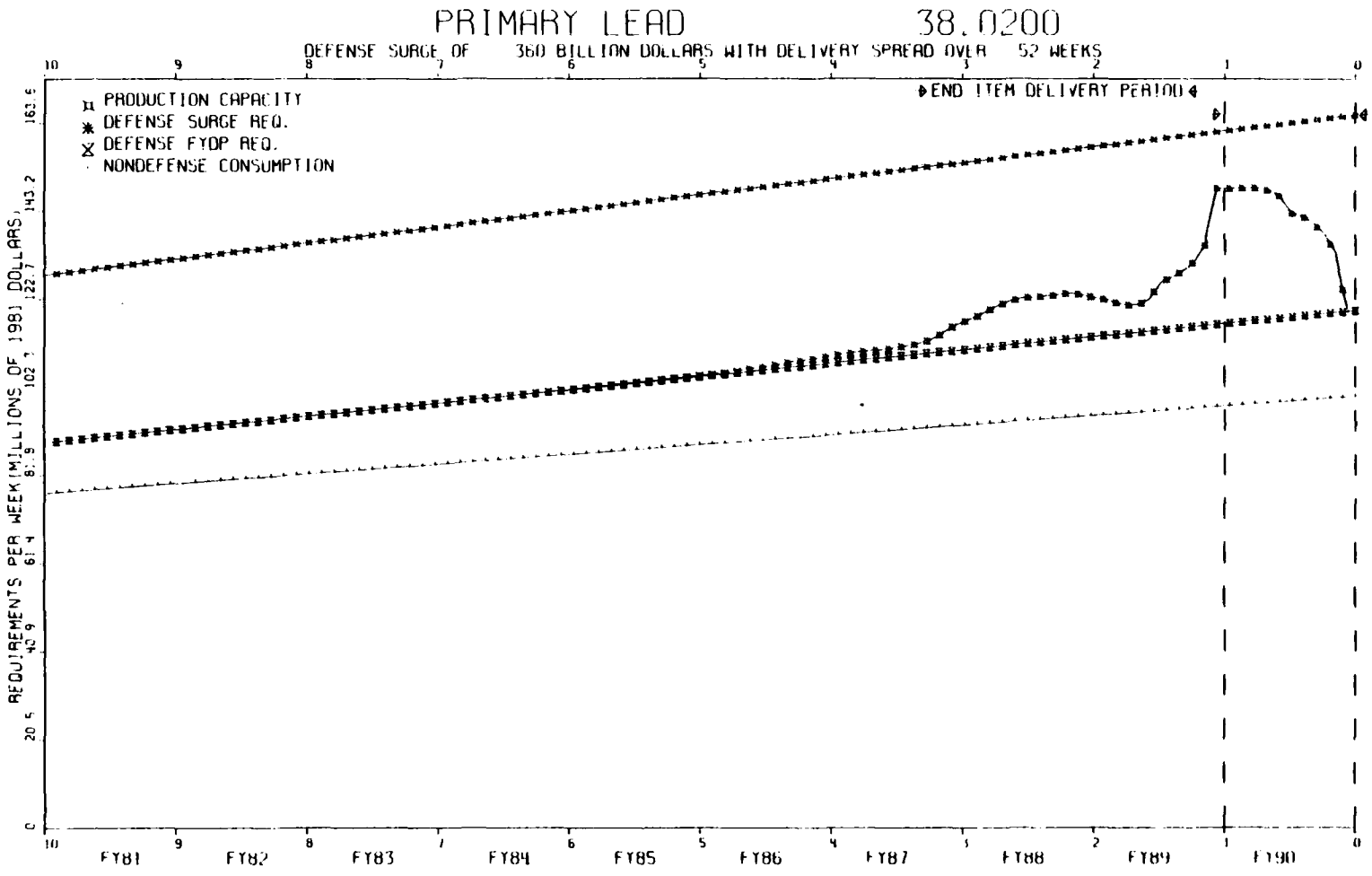
DEFENSE SURGE OF 1940 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1951 DOLLARS)
922
806.9
691.8
576.7
461.5
345.4
230.3
115.2
0
10
9
8
7
6
5
4
3
2
1
0
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90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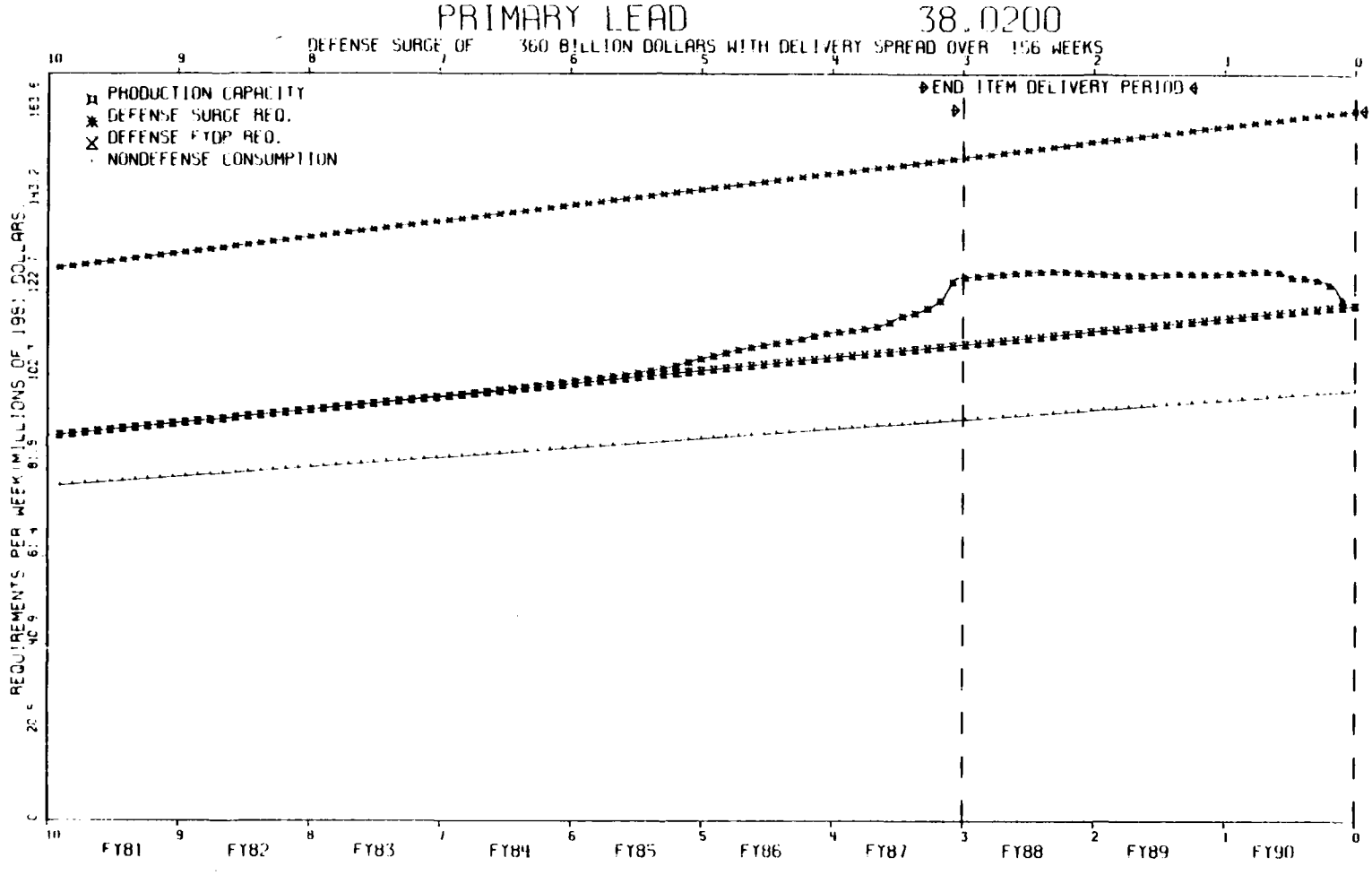
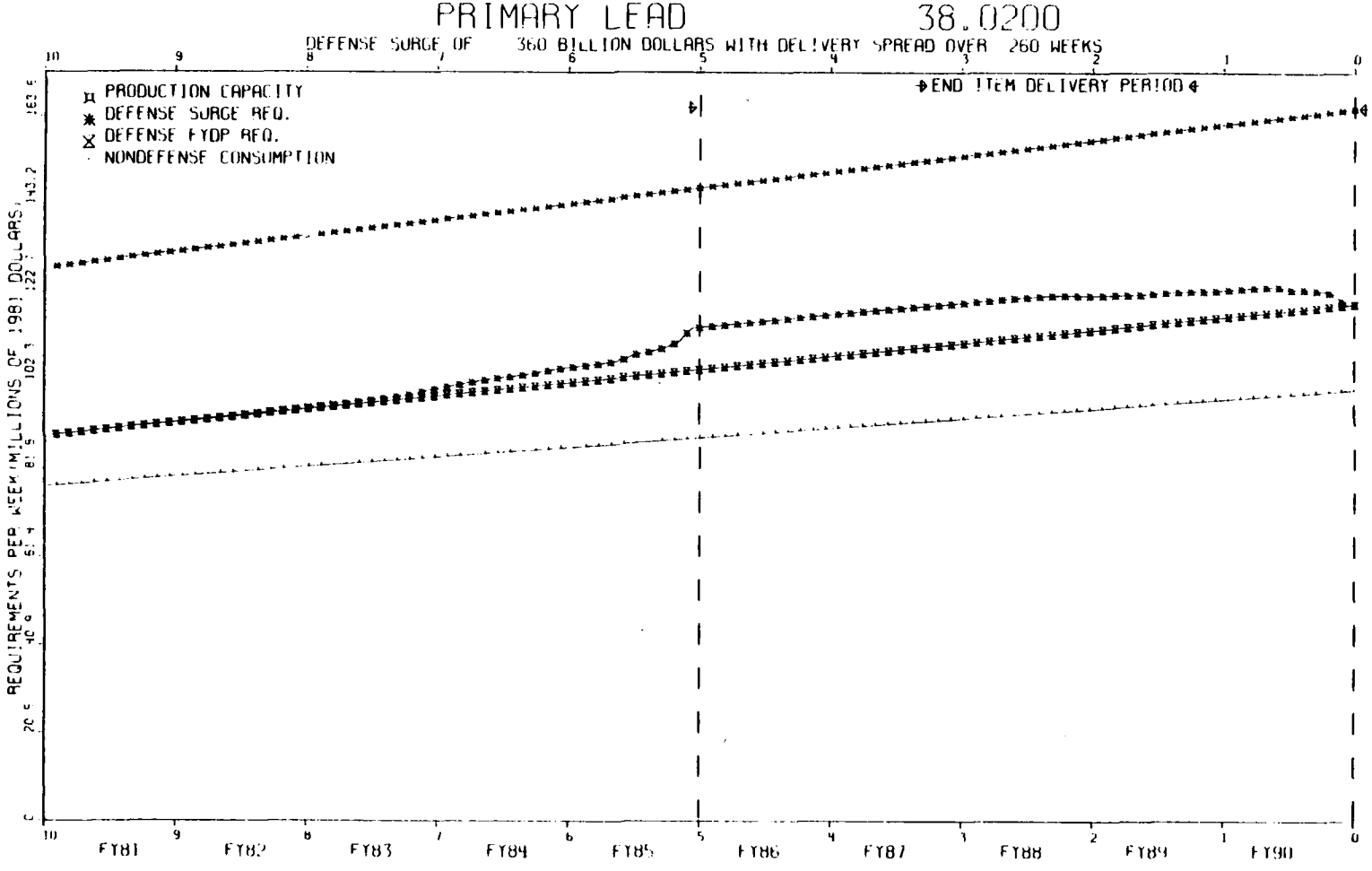
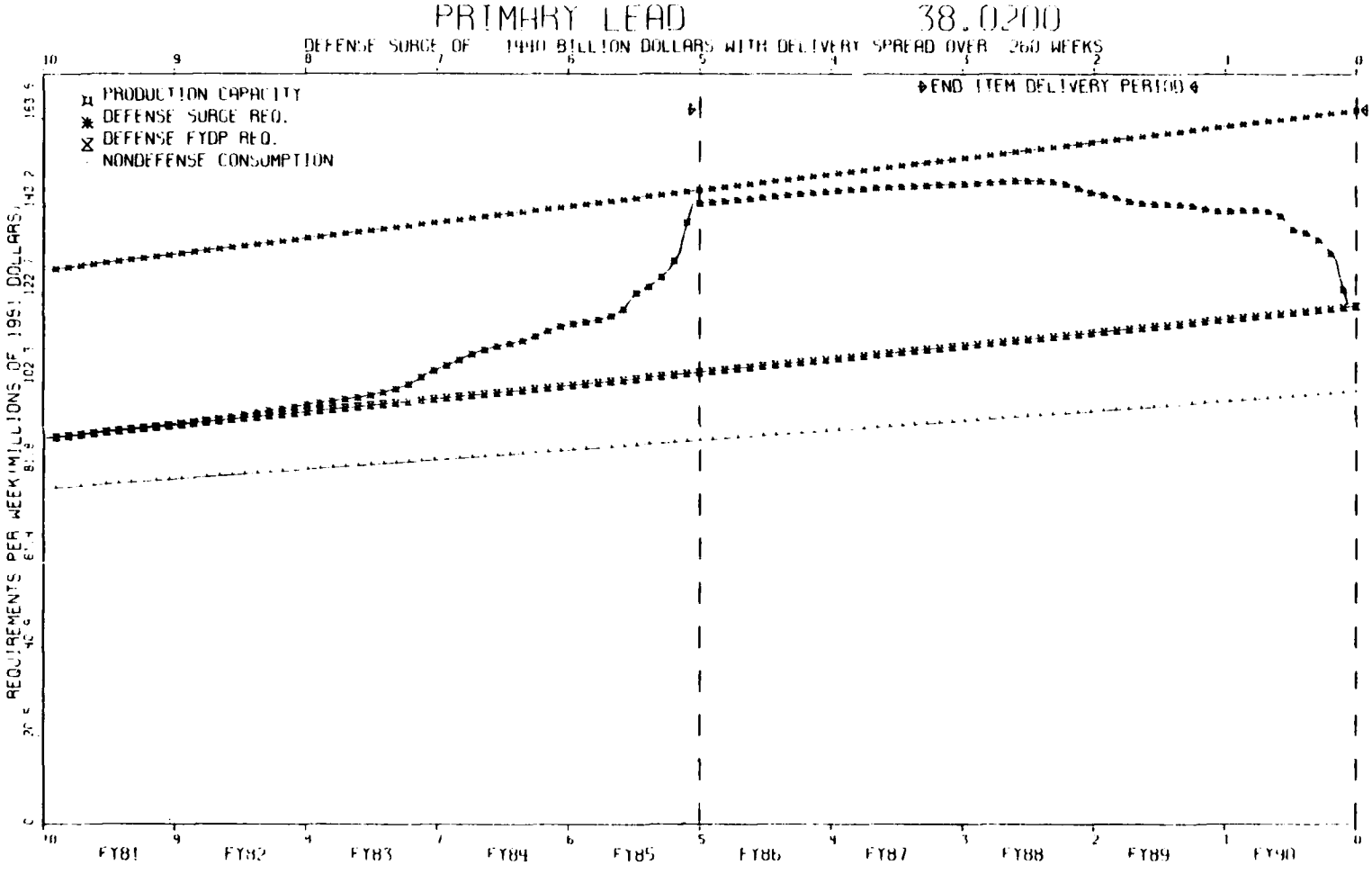
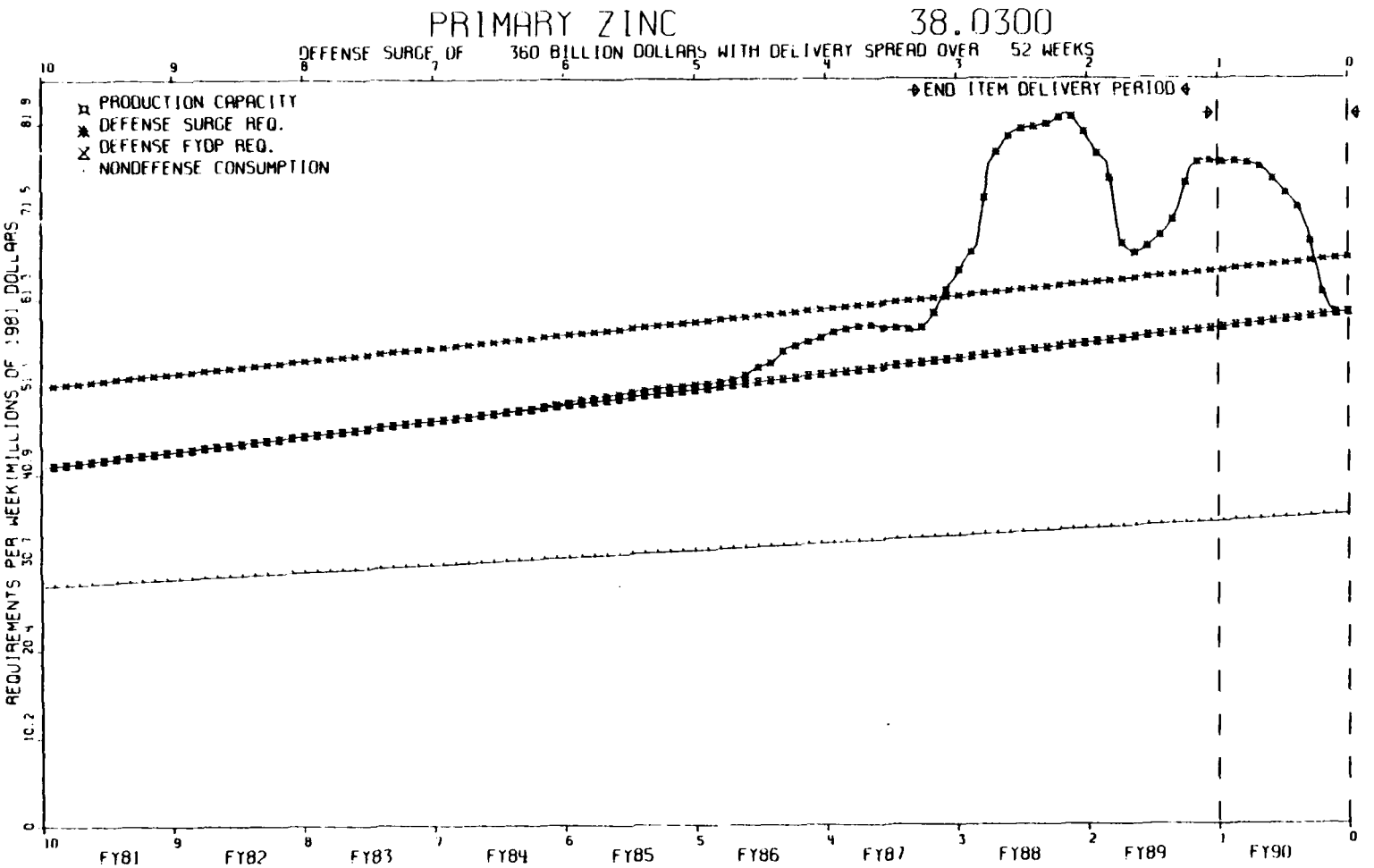
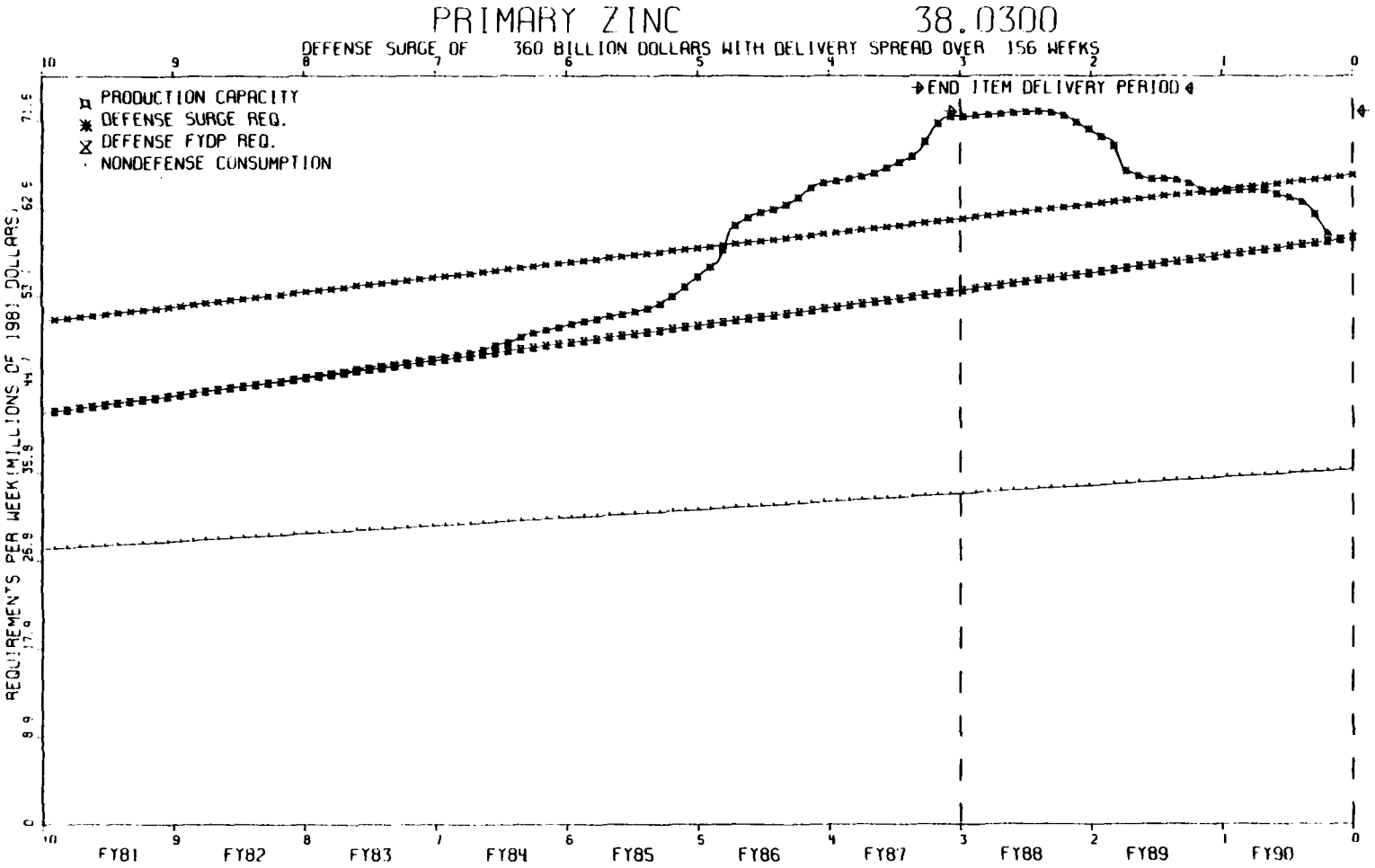
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
0
20.5
40.9
61.4
81.9
102.3
122.7
143.2
163.6
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

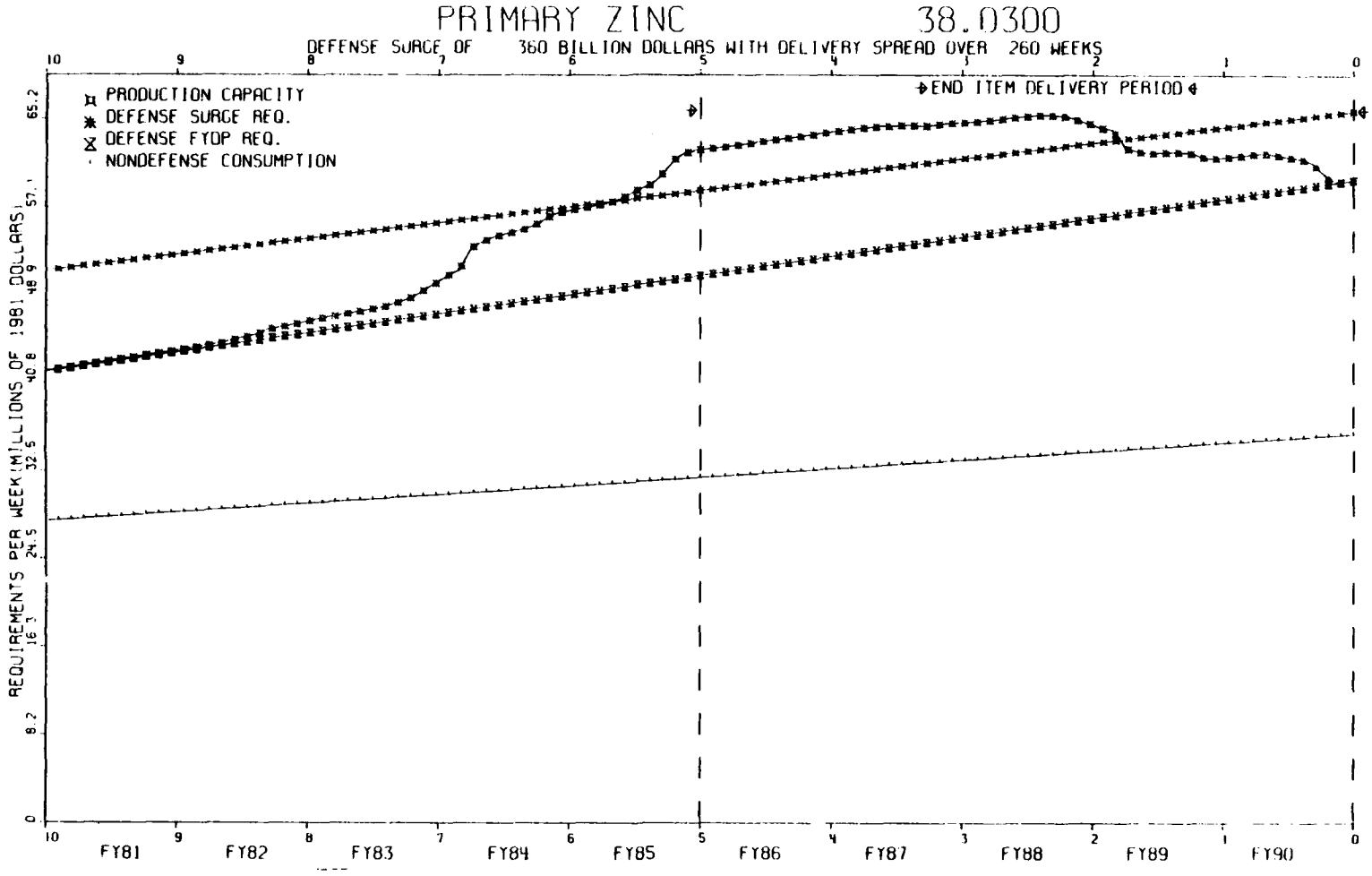

PRIMARY LEAD 38.0200
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE PTOP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK IN MILLIONS OF 1951 DOLLARS
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

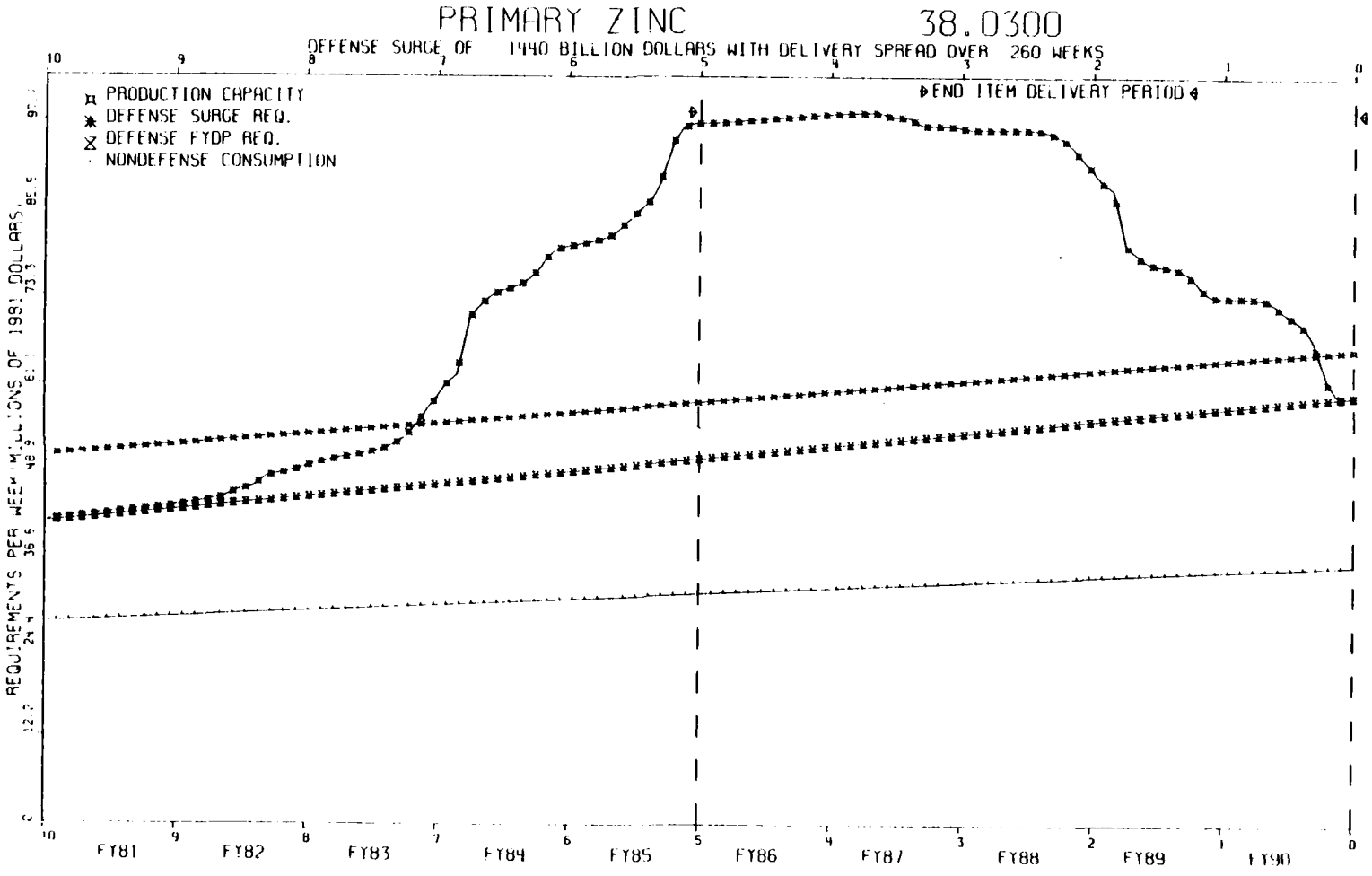

PRIMARY LEAD 38.0200
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK IN MILLIONS OF 1981 DOLLARS
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

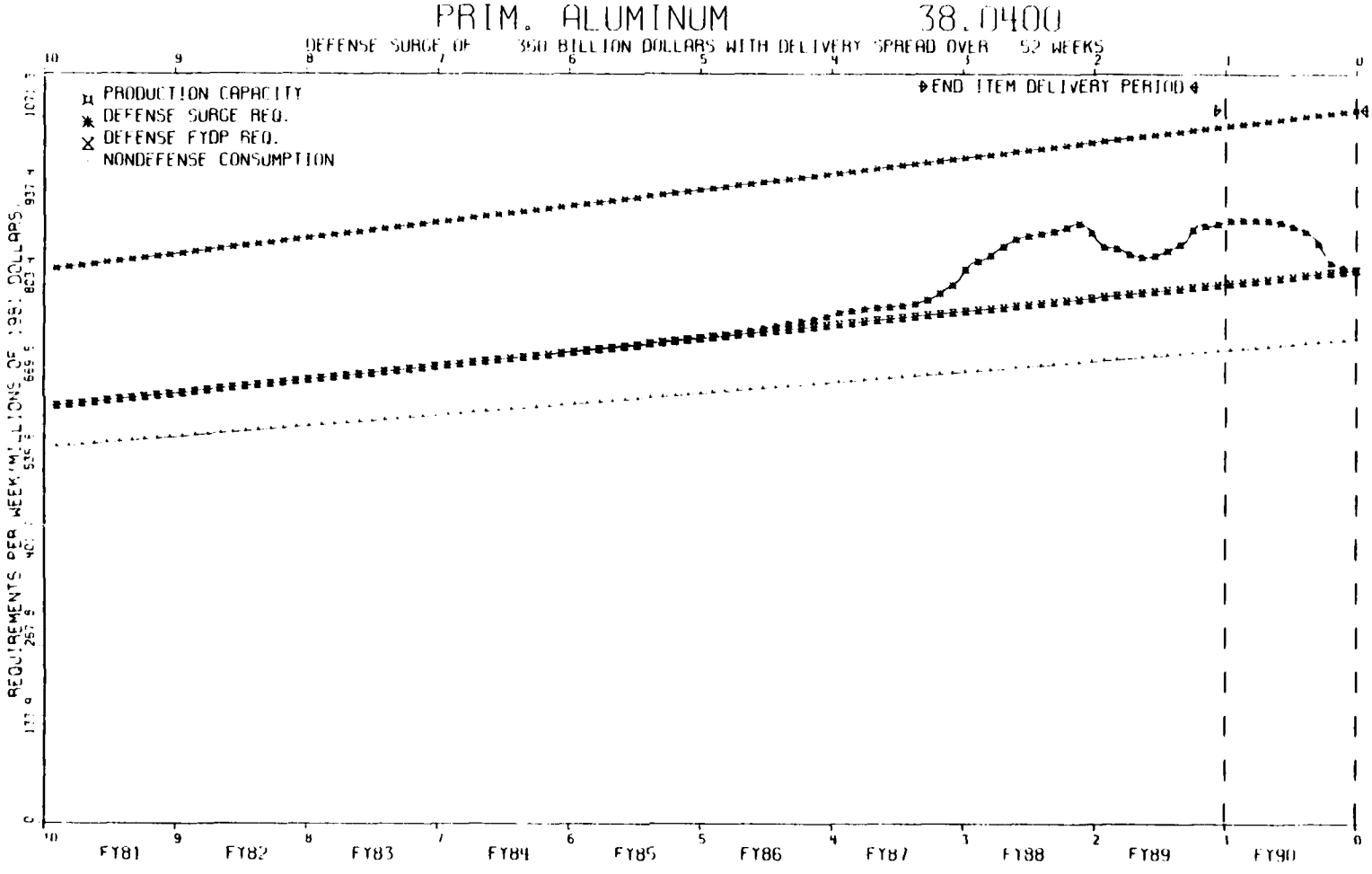

PRIMARY LEAD 38.0200
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1951 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

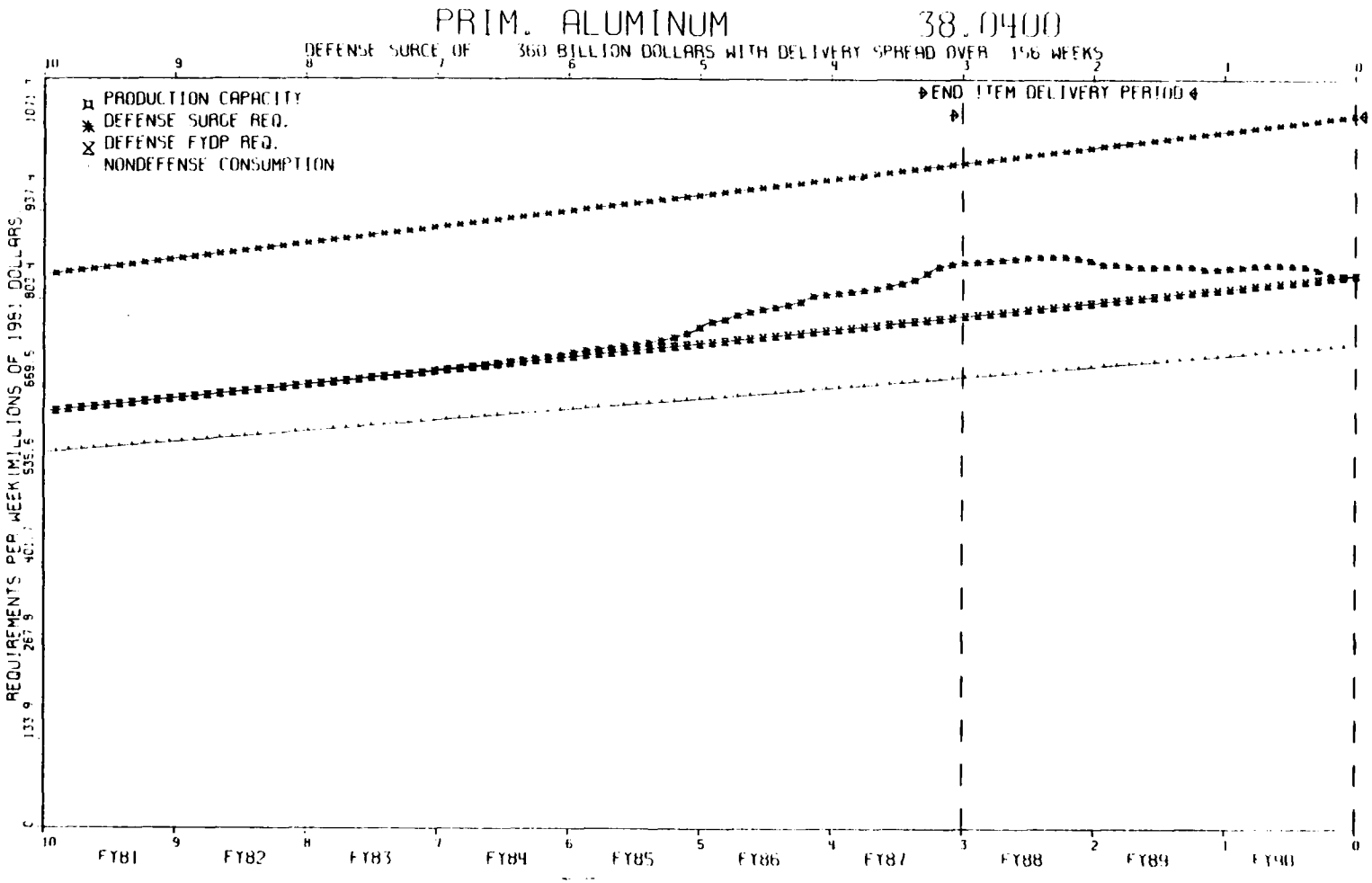

PRIMARY ZINC 38.0300
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
0
10.2
20.4
30.7
40.9
51.1
61.3
71.5
81.9
10
9
8
7
6
5
4
3
2
1
0
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

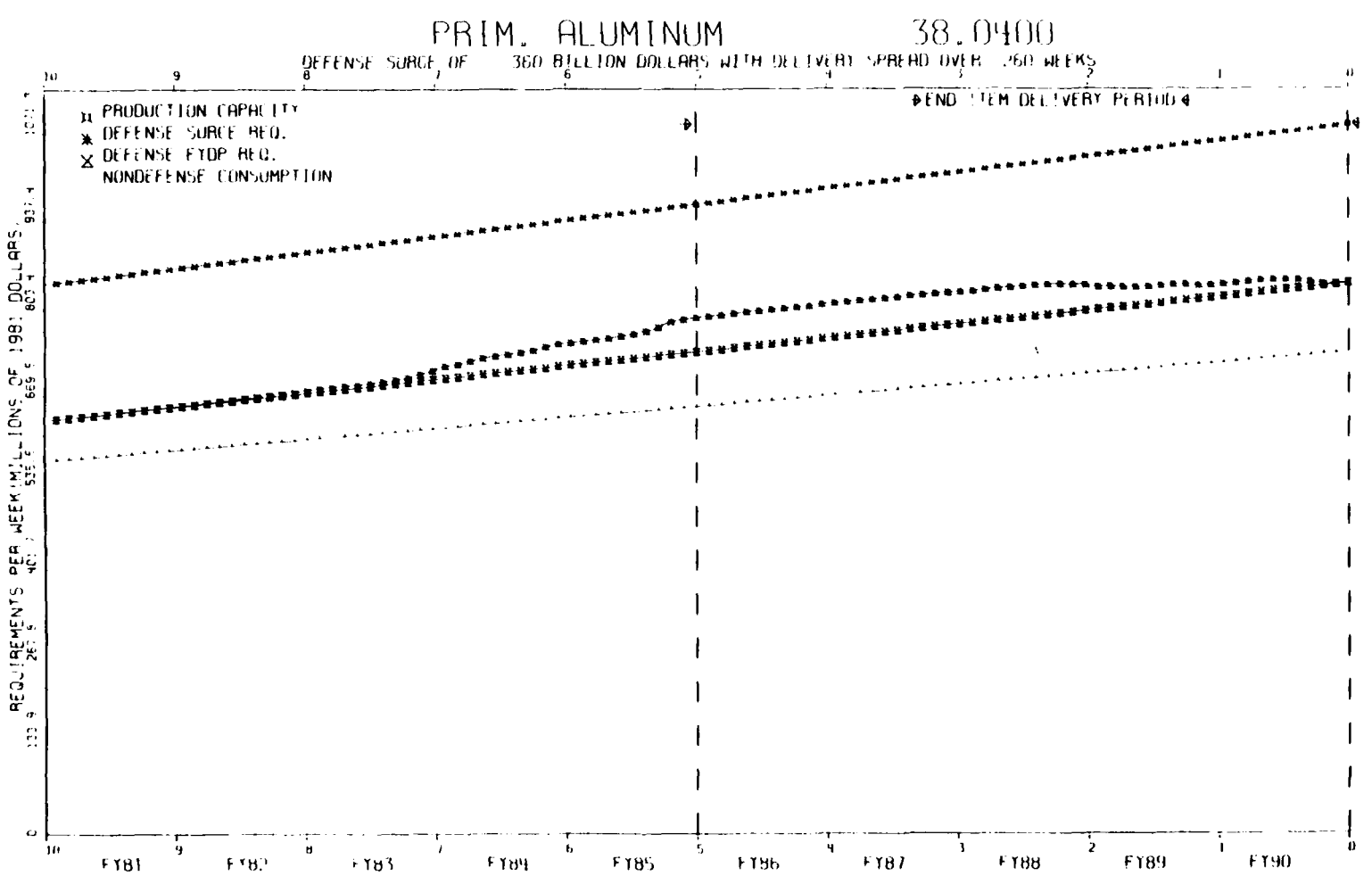

PRIMARY ZINC 38.0300
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
0
8.9
17.8
26.8
35.8
44.7
53.7
62.6
71.6
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

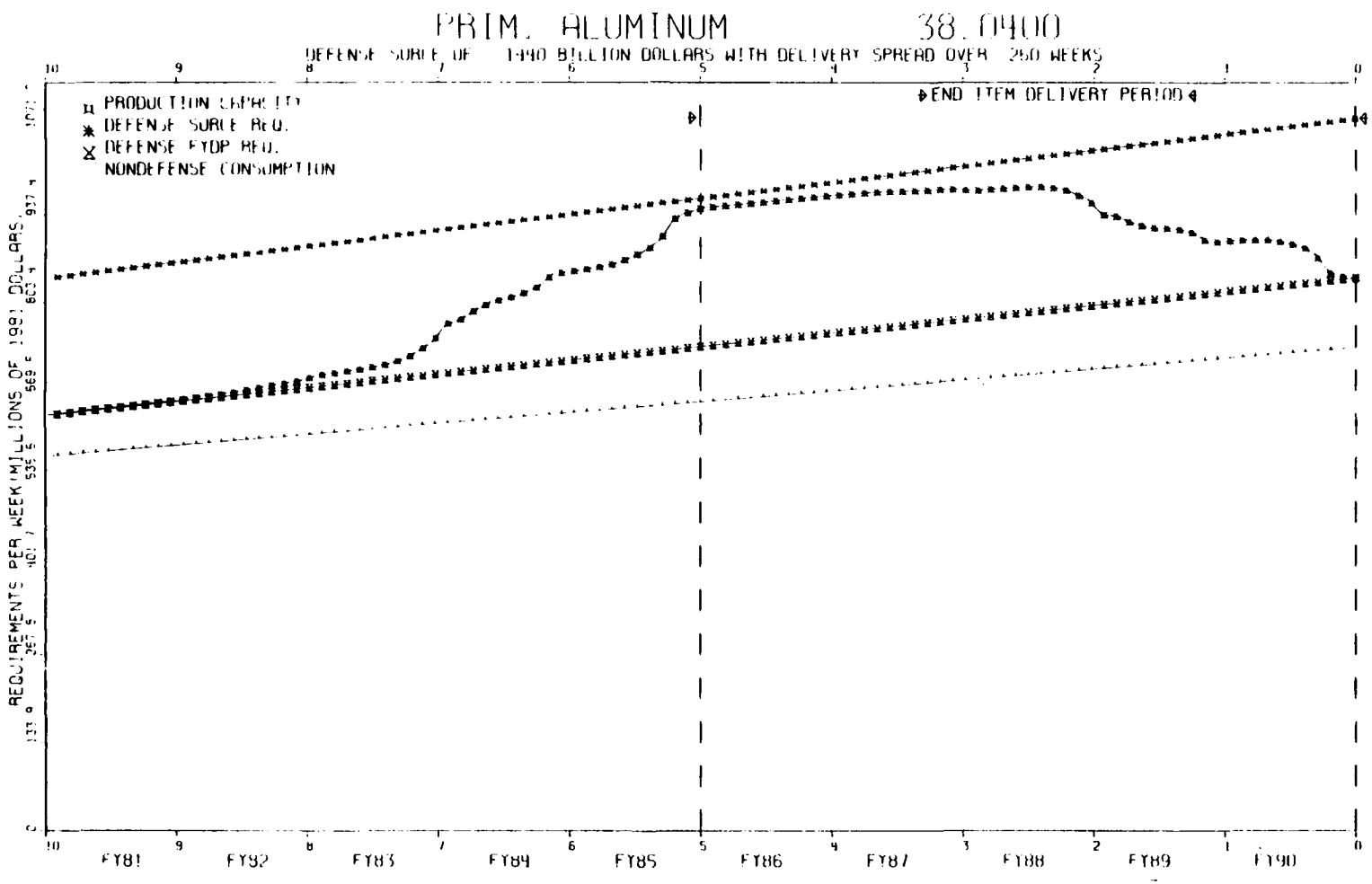

PRIMARY ZINC 38.0300
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
0
8.2
16.3
24.5
32.5
40.8
48.9
57.1
65.2
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

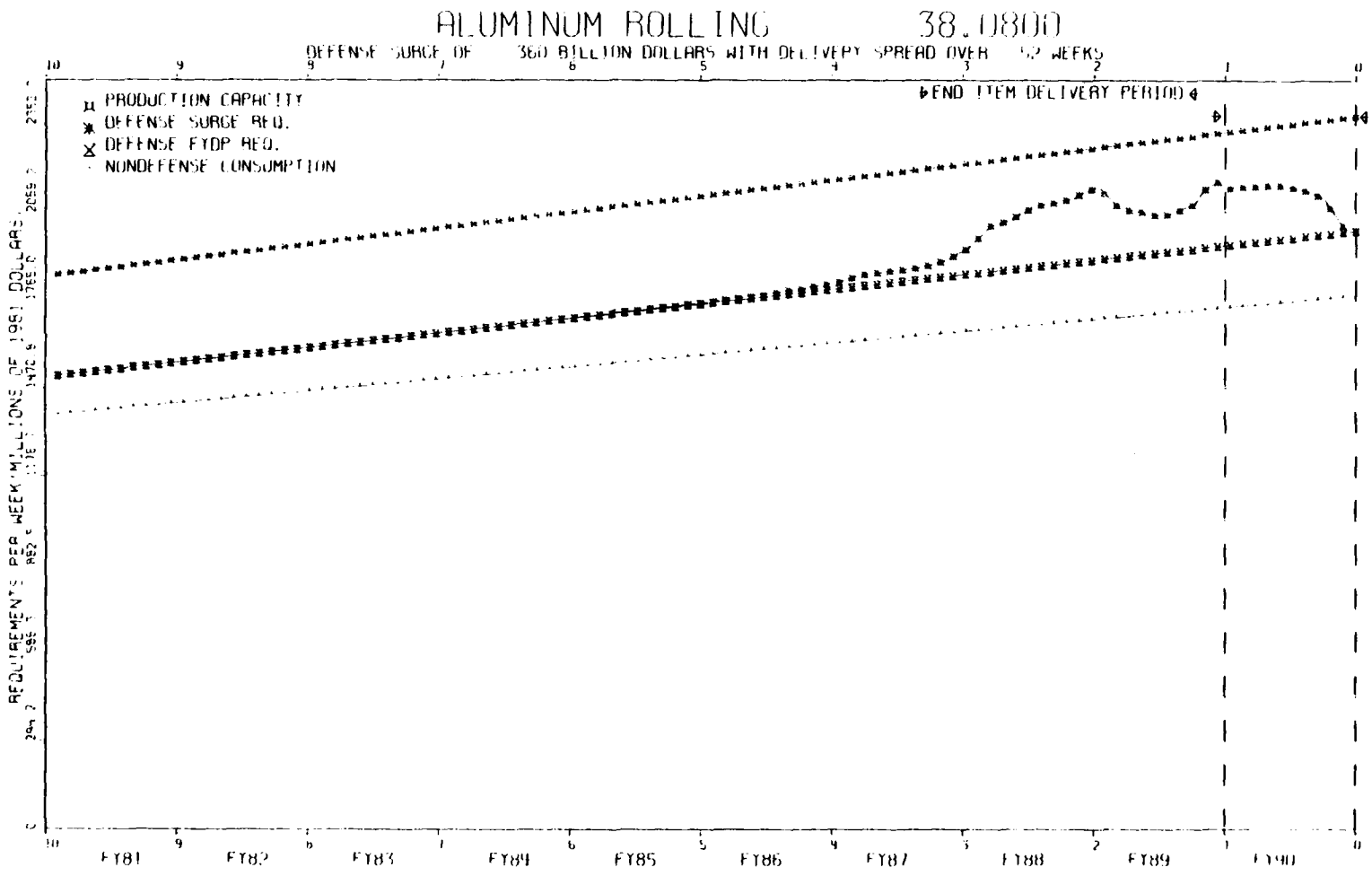

PRIMARY ZINC
38.0300
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK, MILLIONS OF 1981 DOLLARS
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

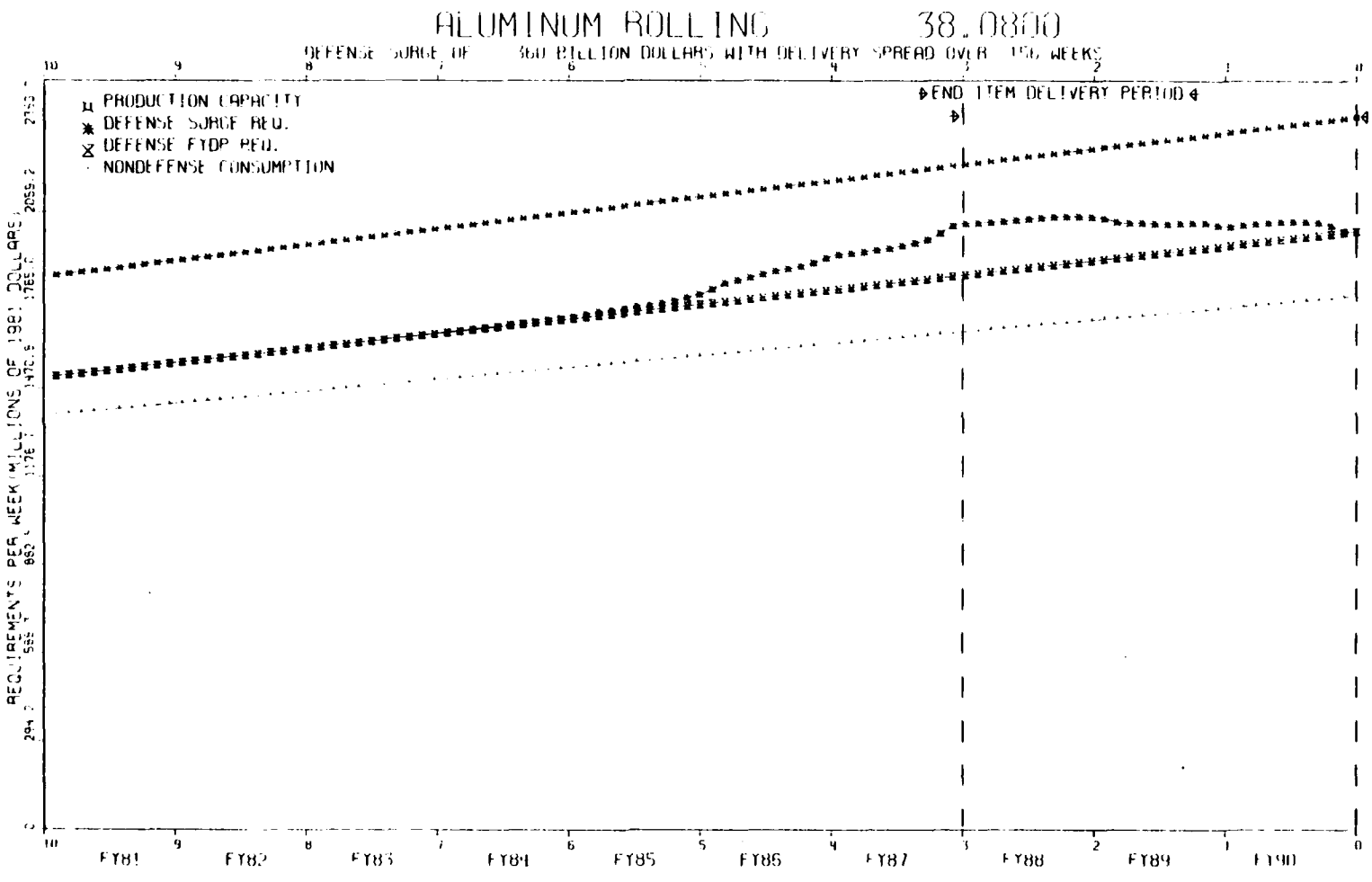

PRIM. ALUMINUM 38.0400
DEFENSE SURGE OF 350 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK, MILLIONS OF 1981 DOLLARS
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

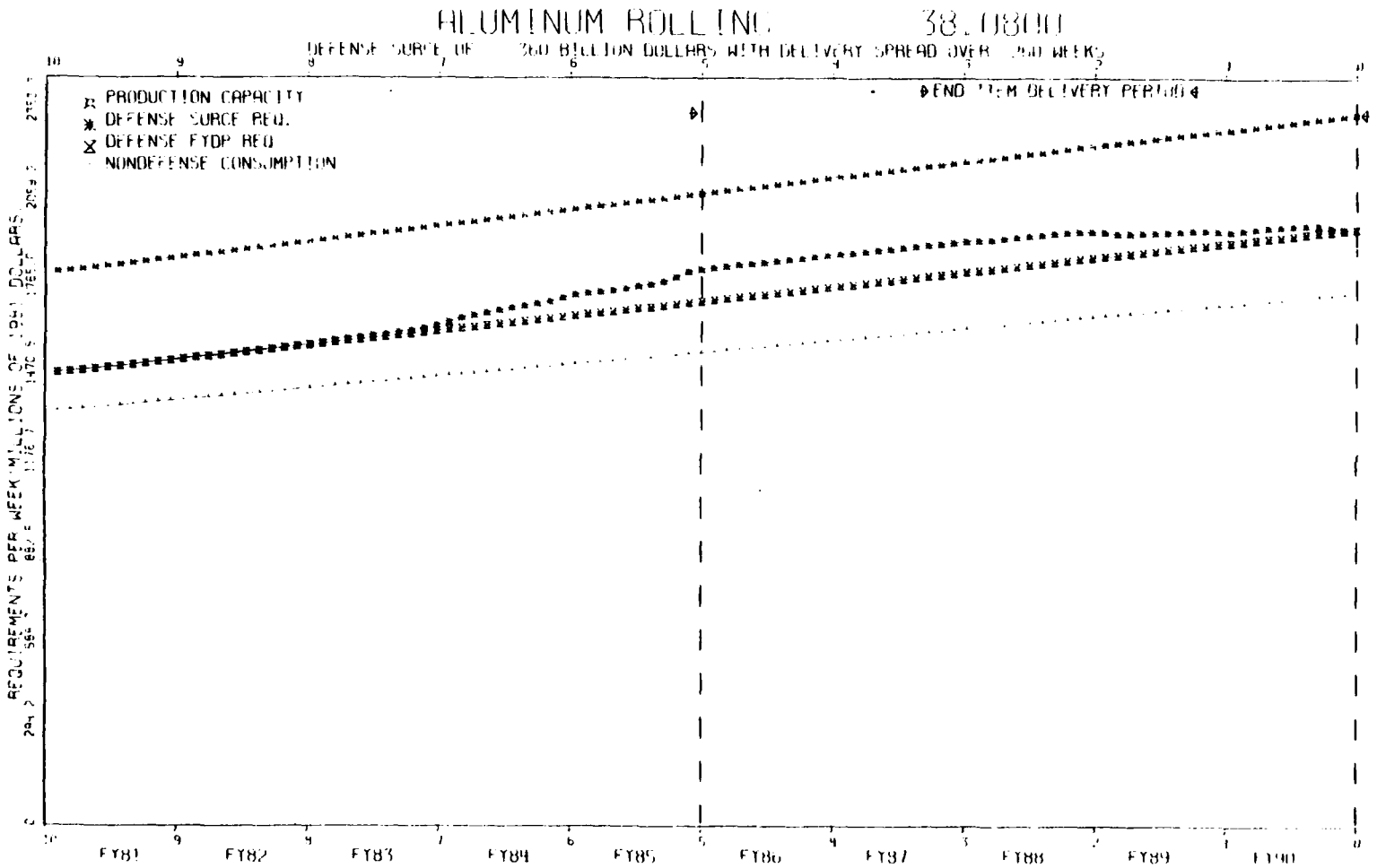

PRIM. ALUMINUM 38.0400
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK IN MILLIONS OF 1951 DOLLARS
133.9
267.8
401.7
535.6
669.5
803.4
937.3
1071.2
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

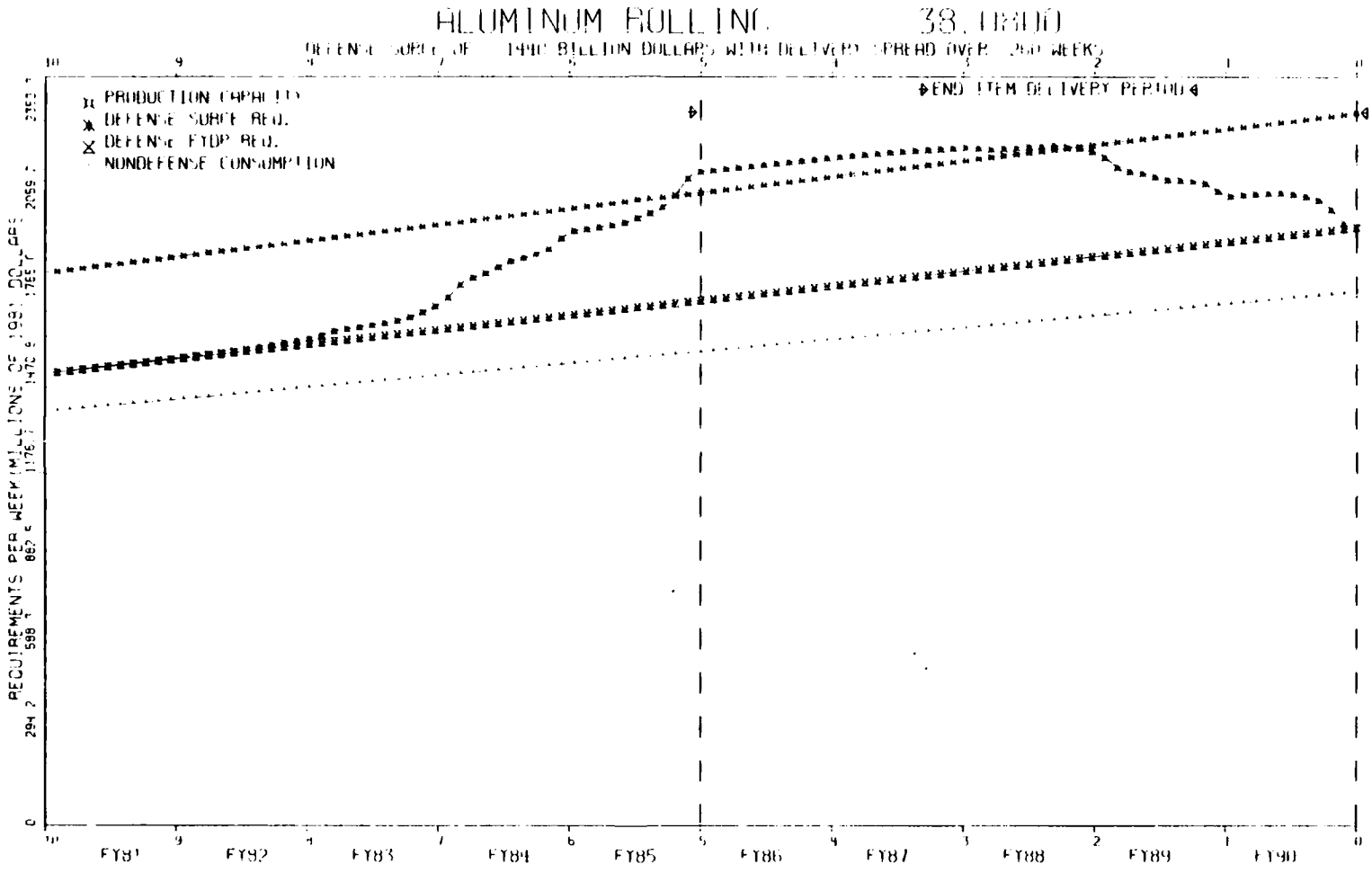

PRIM. ALUMINUM 38.0400
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

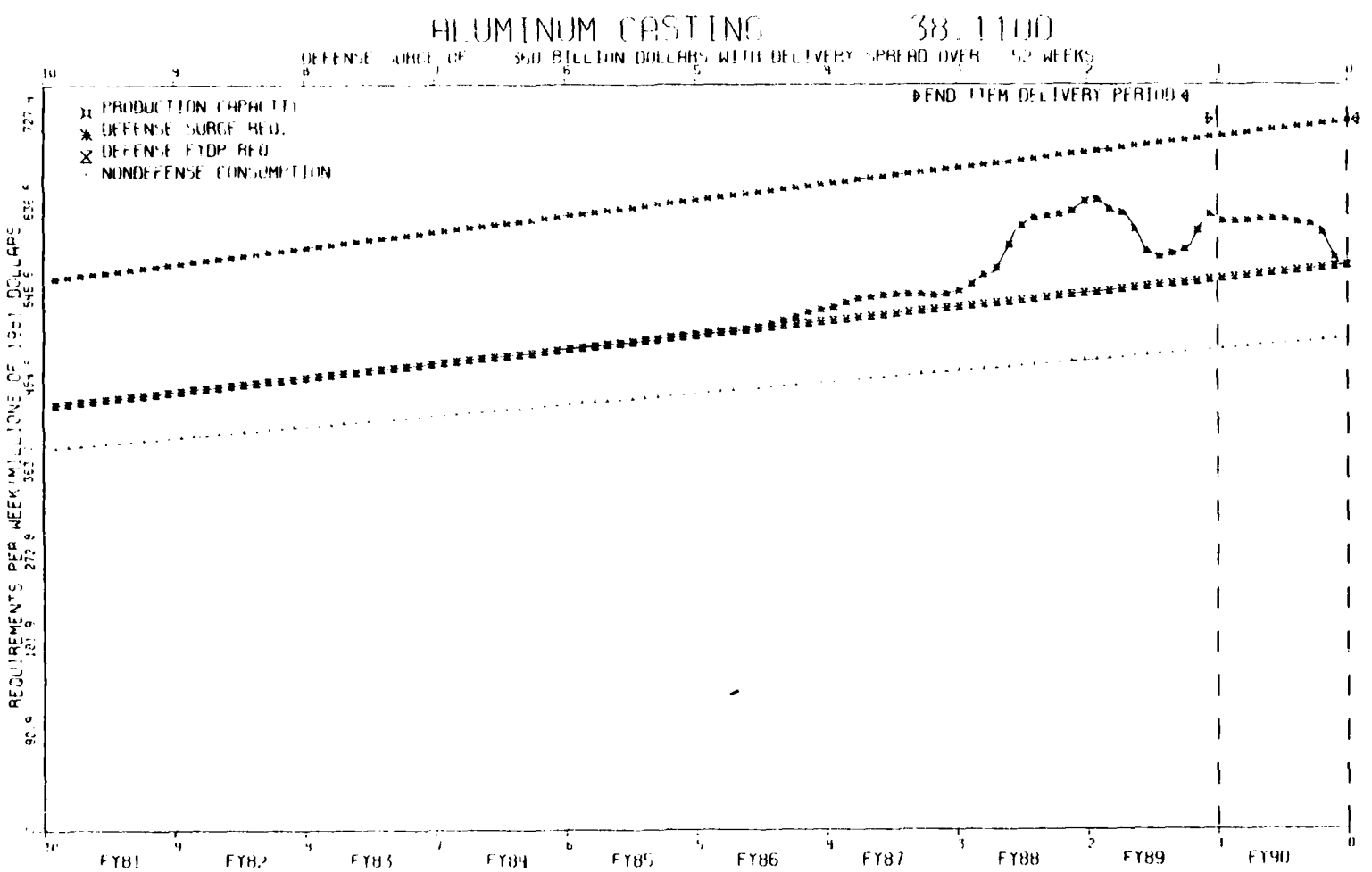

PRIM. ALUMINUM 38.04010
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

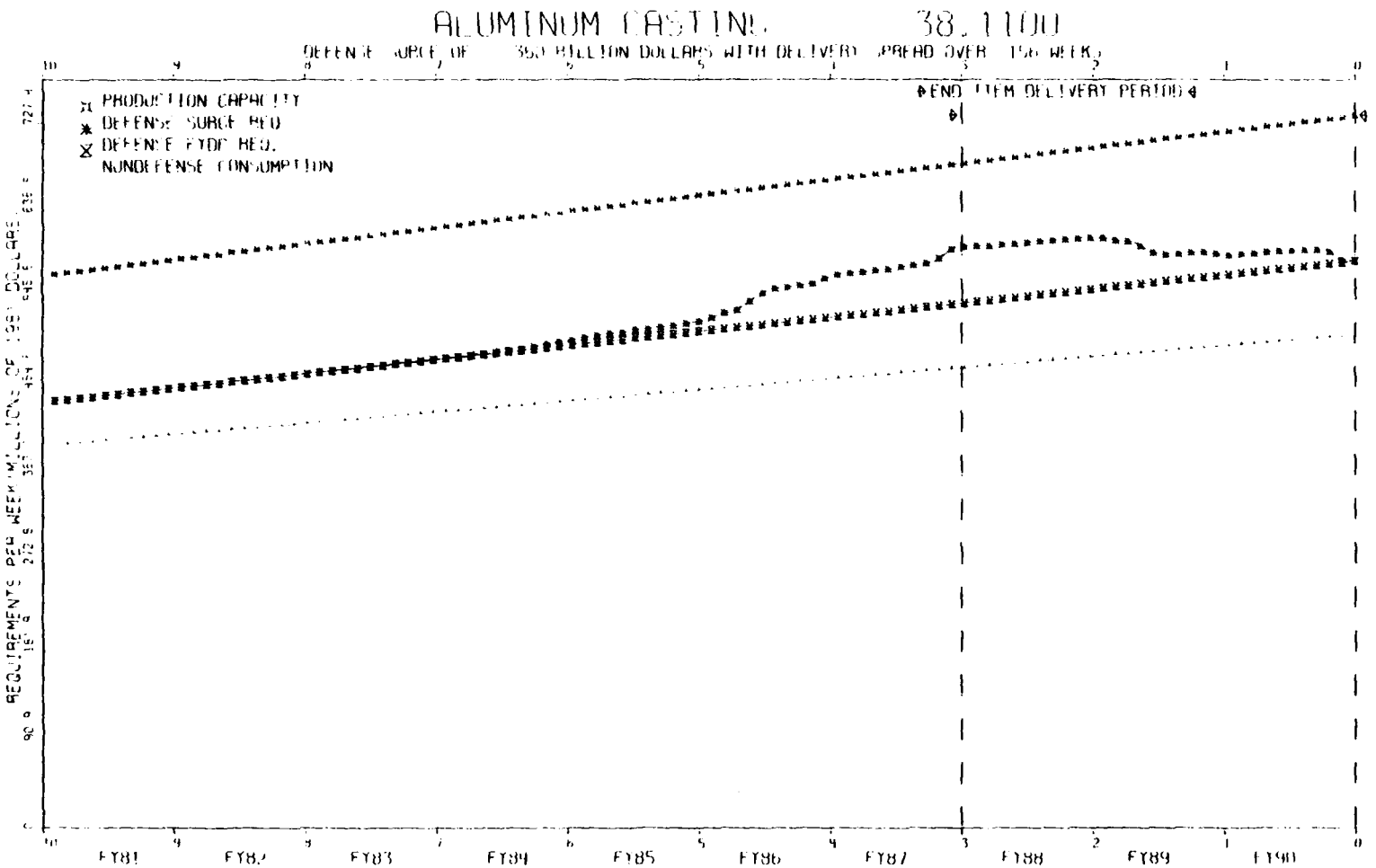

ALUMINUM ROLLING 38.0800
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

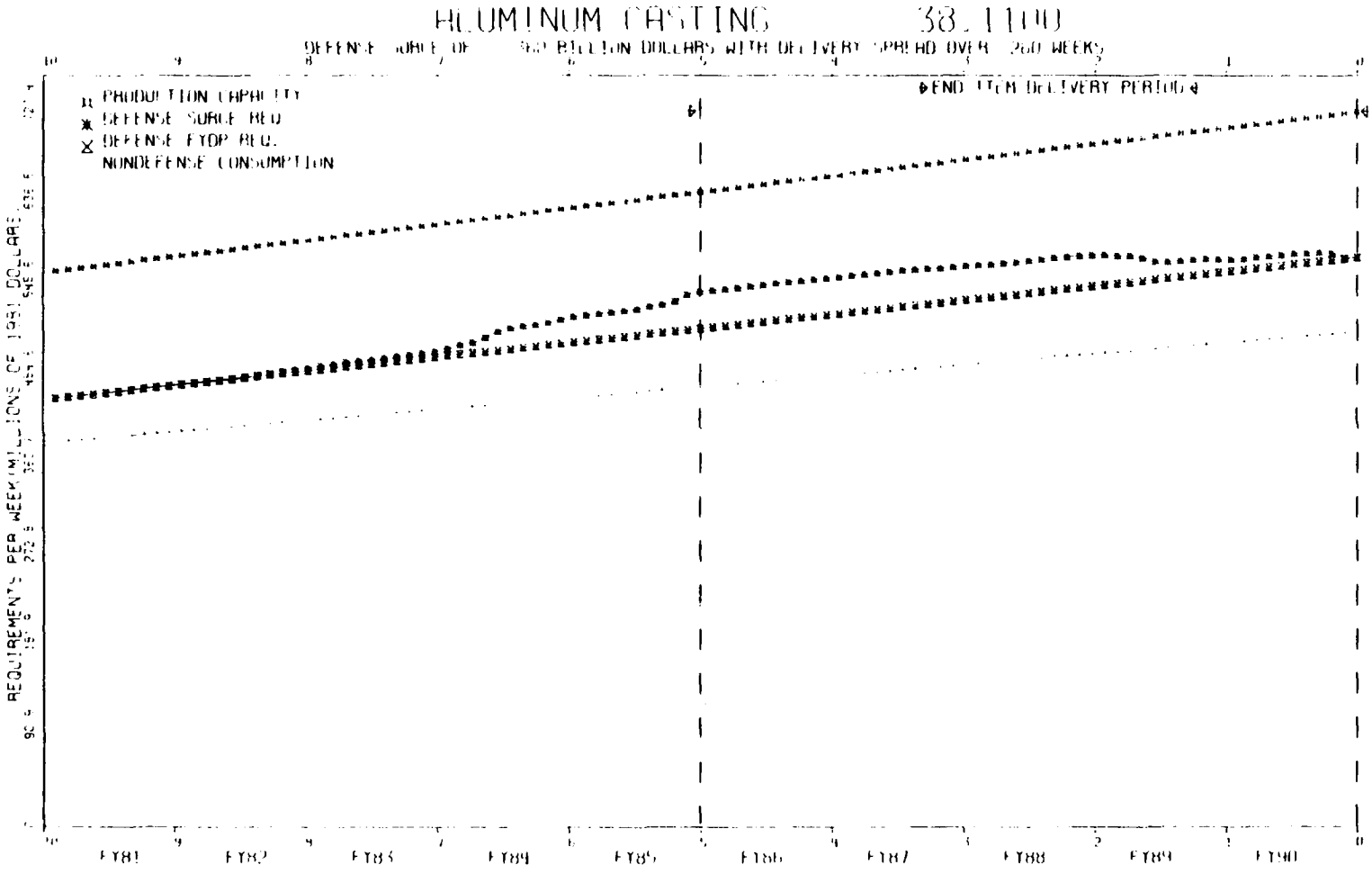

ALUMINUM ROLLING 38.0800
DEFENSE SURGE OF $60 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

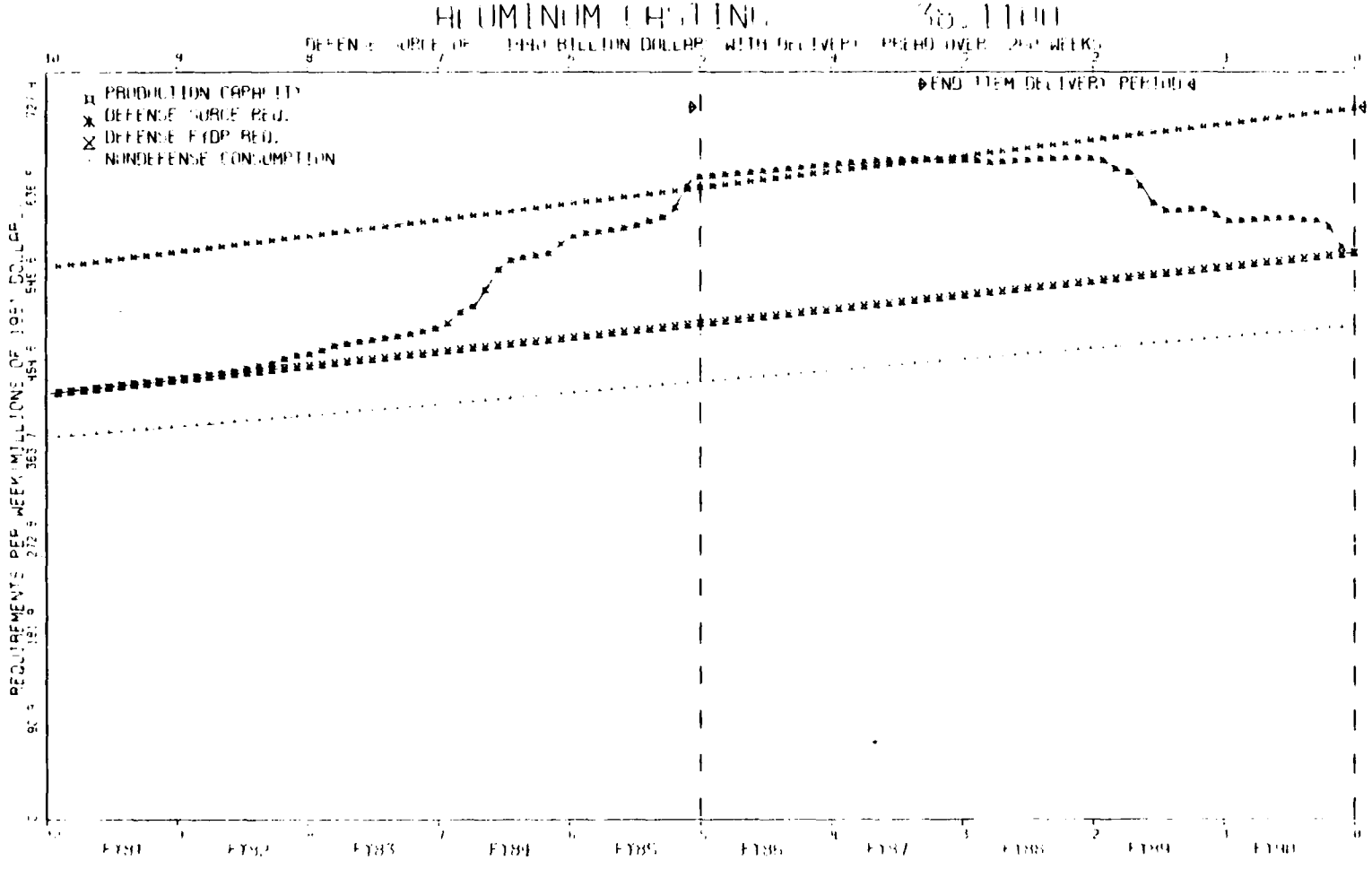

ALUMINUM ROLLING 38.08010
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 360 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

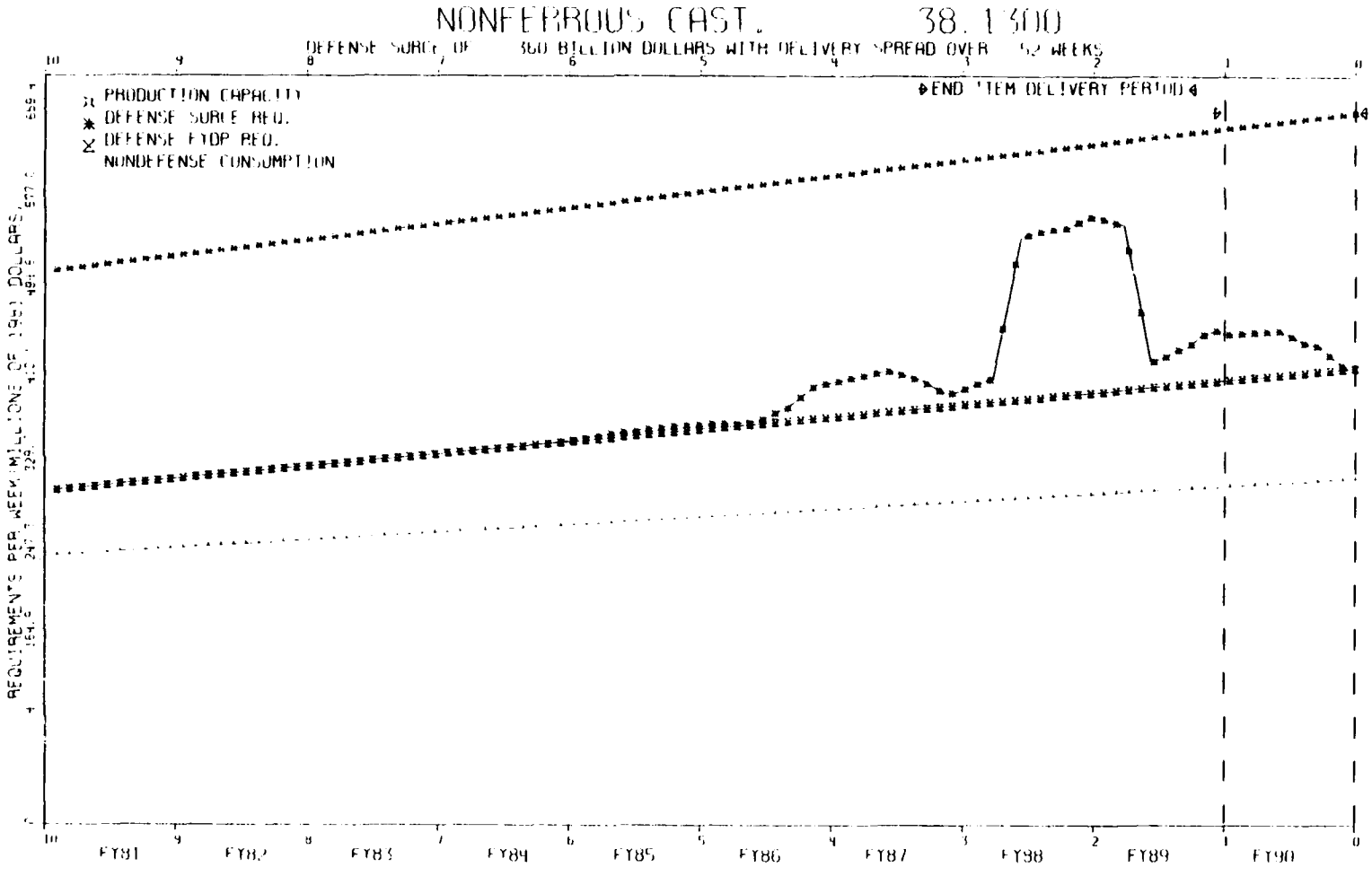

ALUMINUM ROLLING 38.0000
DEFENSE SURGE OF 1990 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPABILITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1982 DOLLARS)
294.2
588.4
882.6
1176.7
1470.9
1765.1
2059.3
2353.5
10
9
8
7
6
5
4
3
2
1
0
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

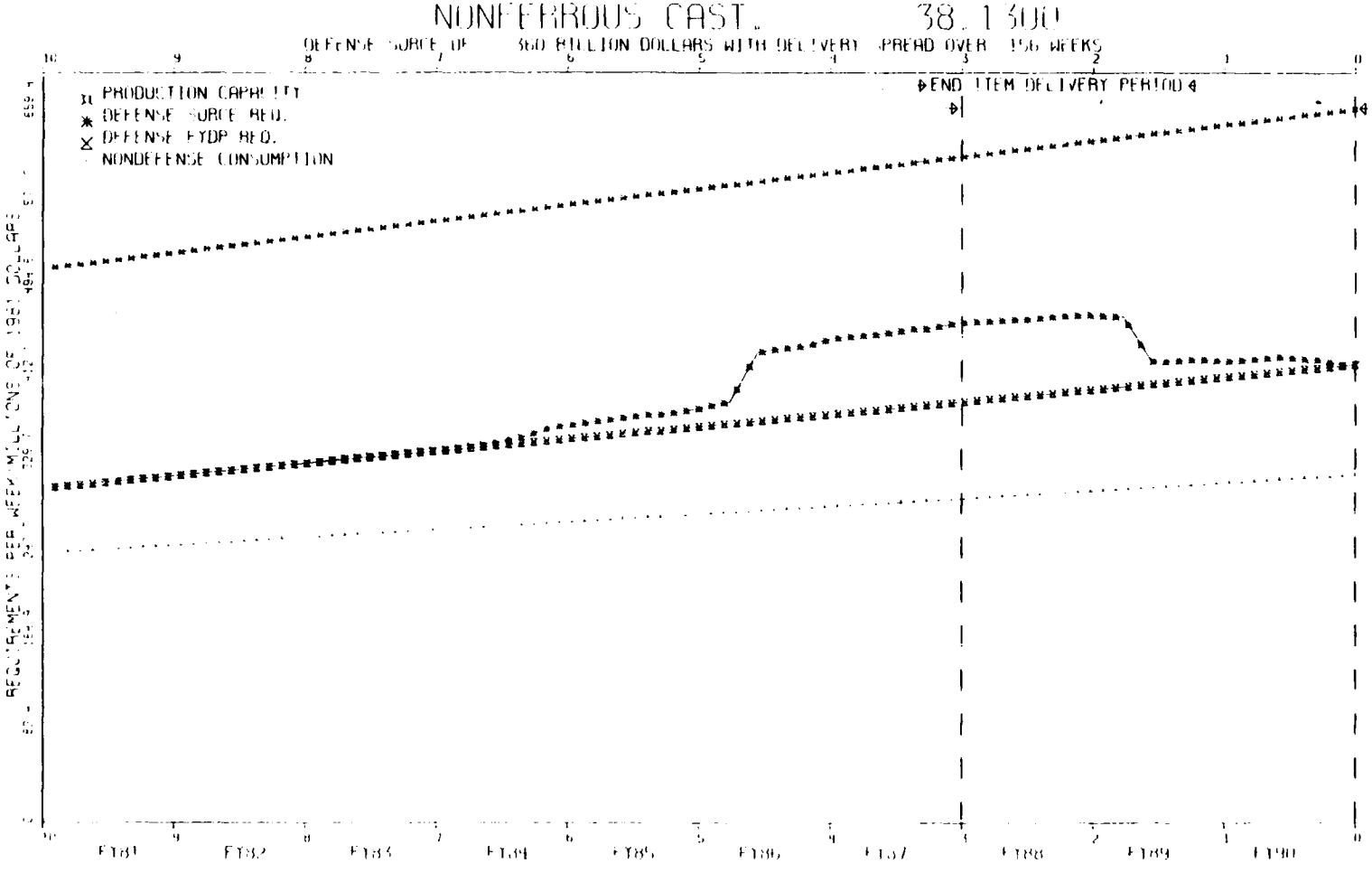

ALUMINUM CASTING 38.1100
DEFENSE SURGE OF $50 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE STOP REQ
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK IN MILLIONS OF 1981 DOLLARS
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

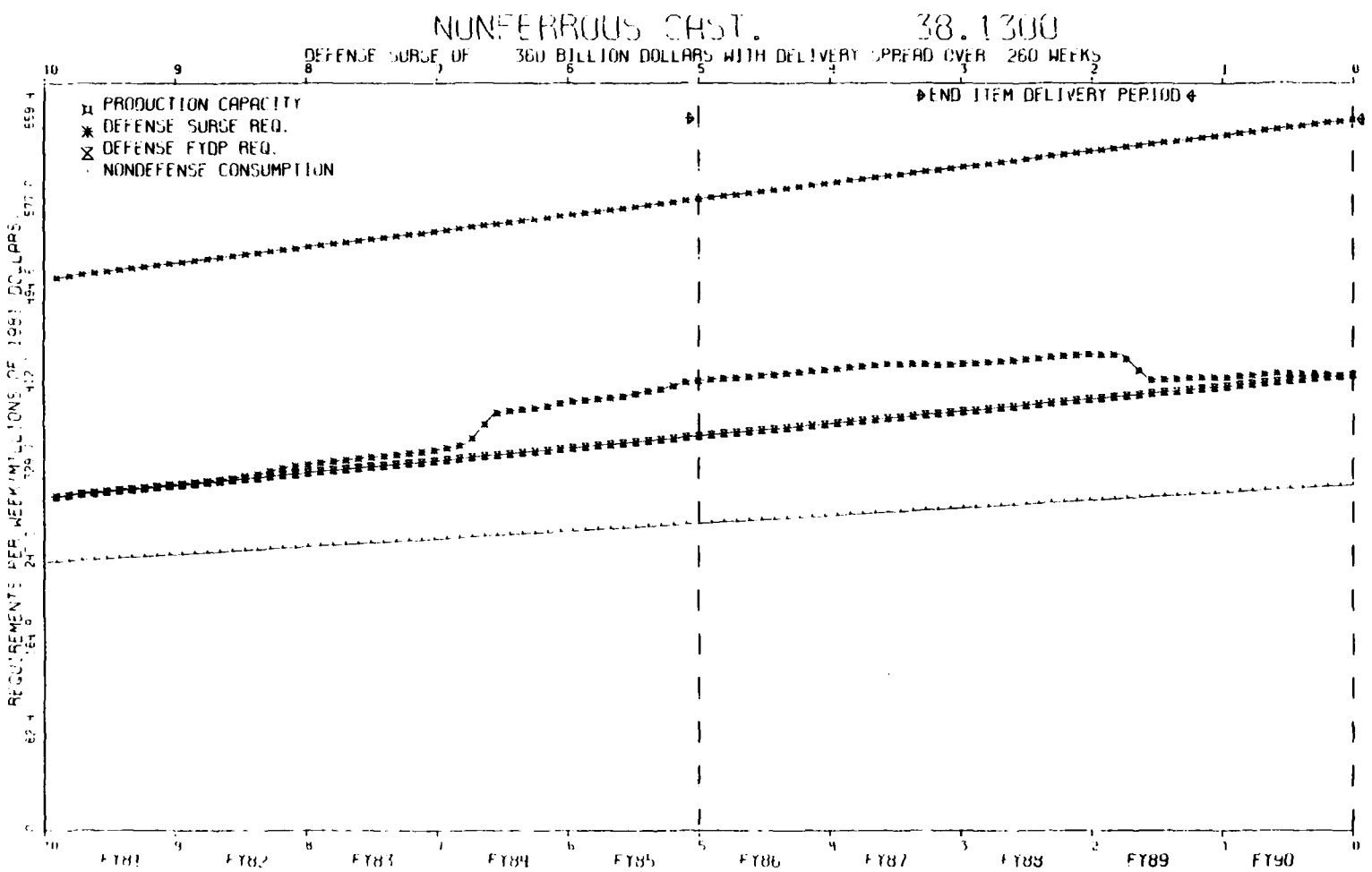

ALUMINUM CASTING 38.1100
DEFENSE SURGE OF 350 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK IN MILLIONS OF 1981 DOLLARS
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

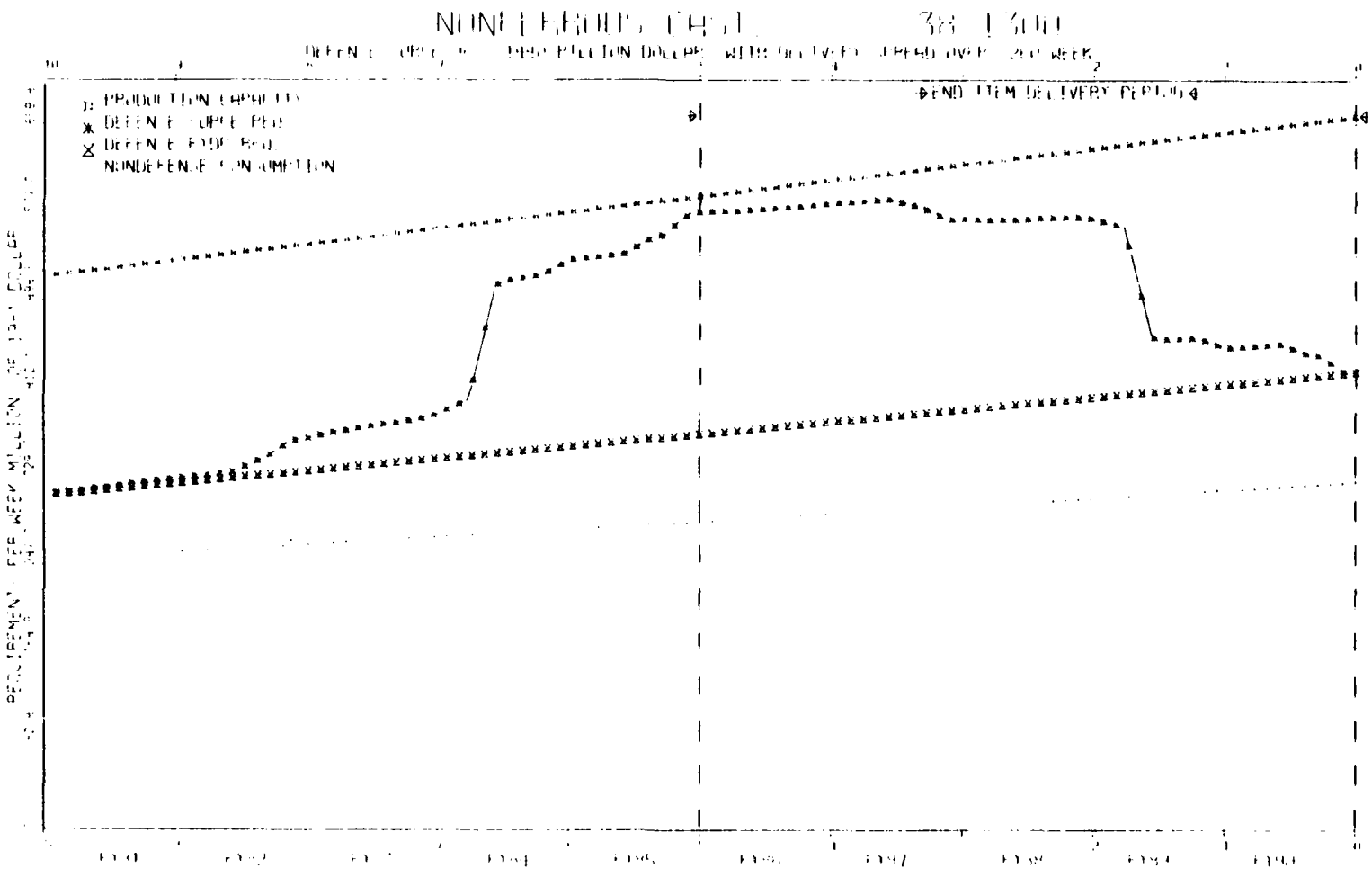

ALUMINUM CASTING 38.1100
DEFENSE SURGE OF $60 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

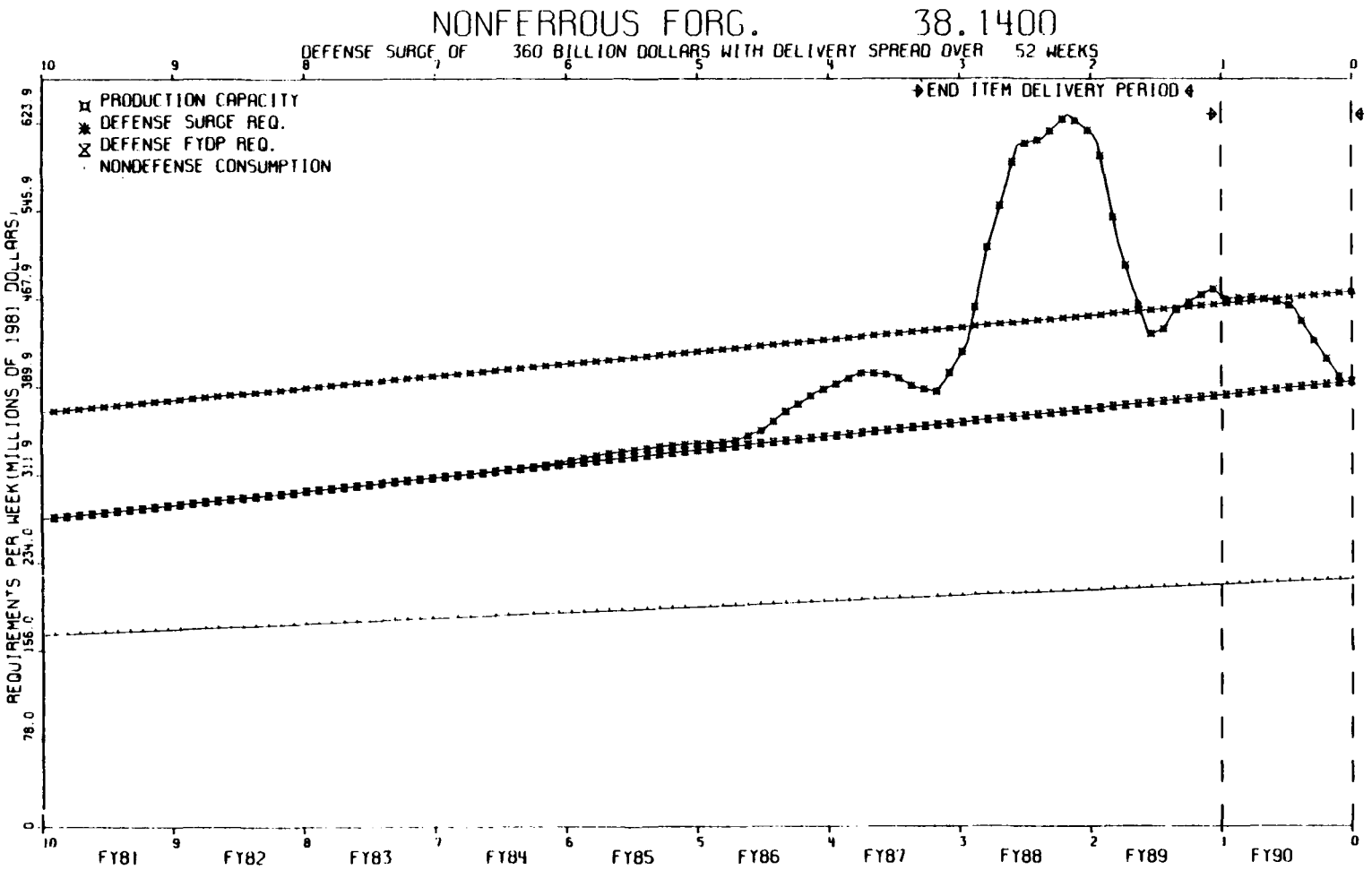

ALUMINUM CASTING
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

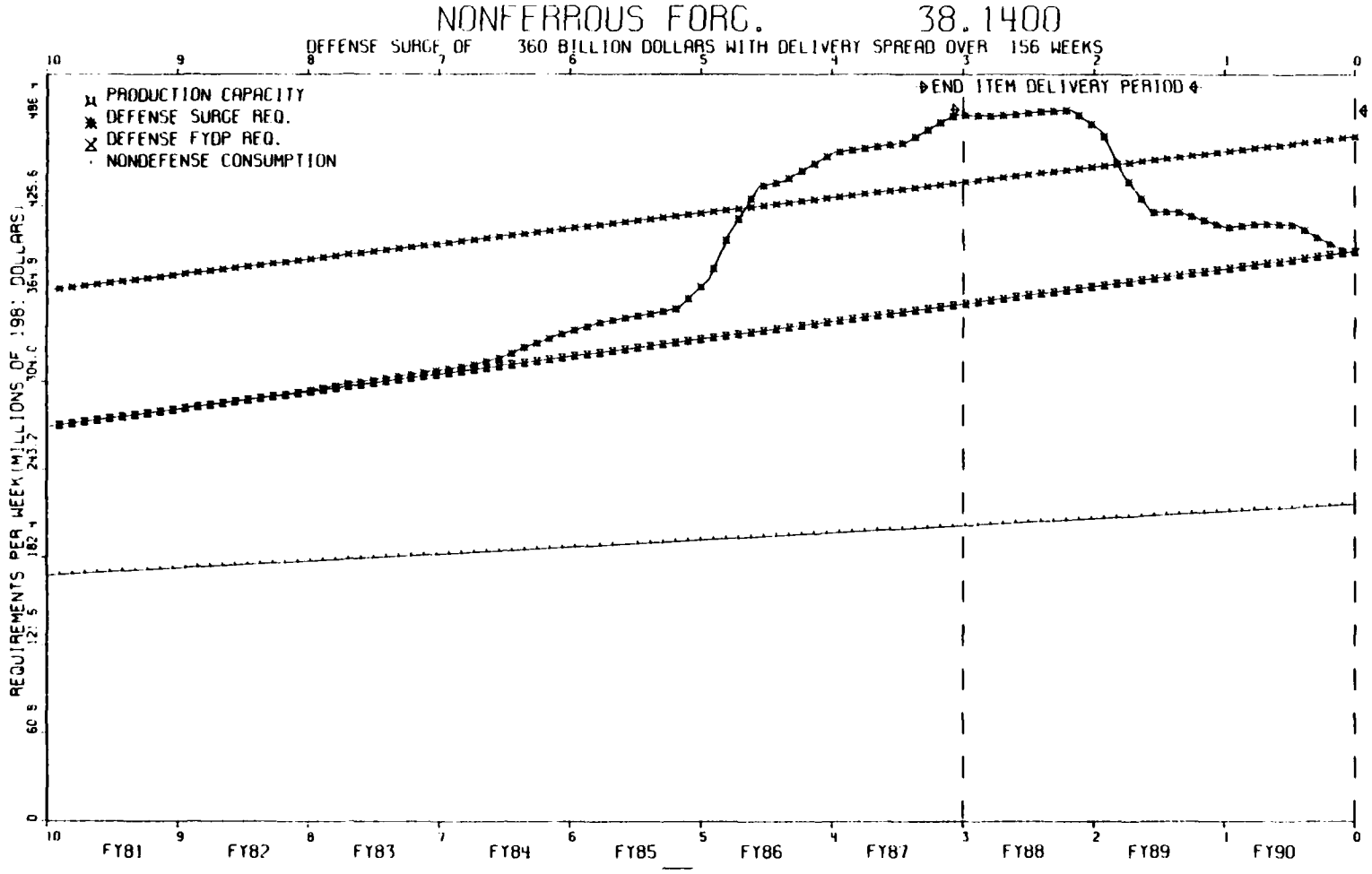

NONFERROUS CAST. 38.1300
DEFENSE SURGE OF $60 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE ETOP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

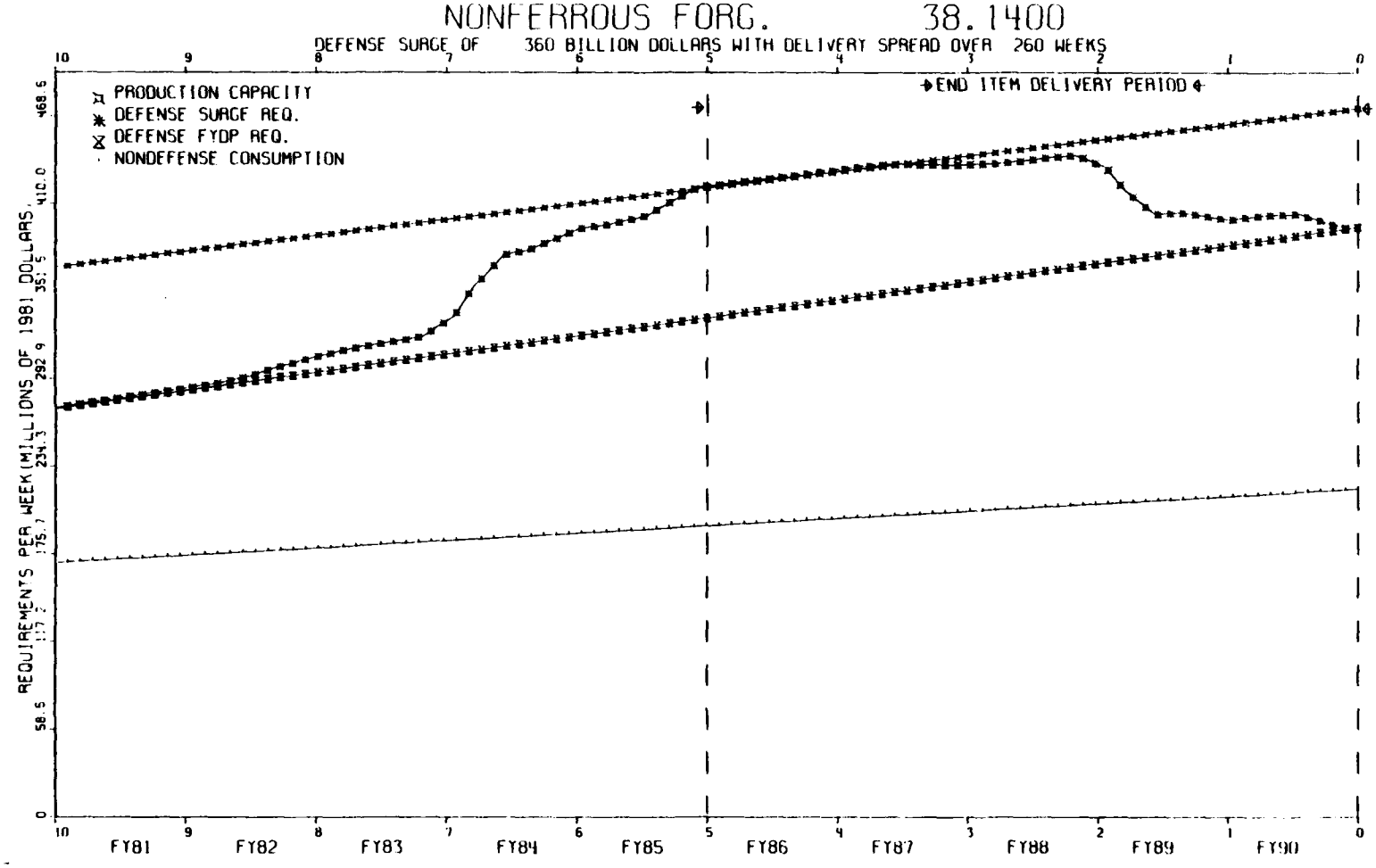

NONFERROUS CAST.
38.1 500
DEFENSE SOURCE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
PRODUCTION CAPACITY
DEFENSE SOURCE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1967 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

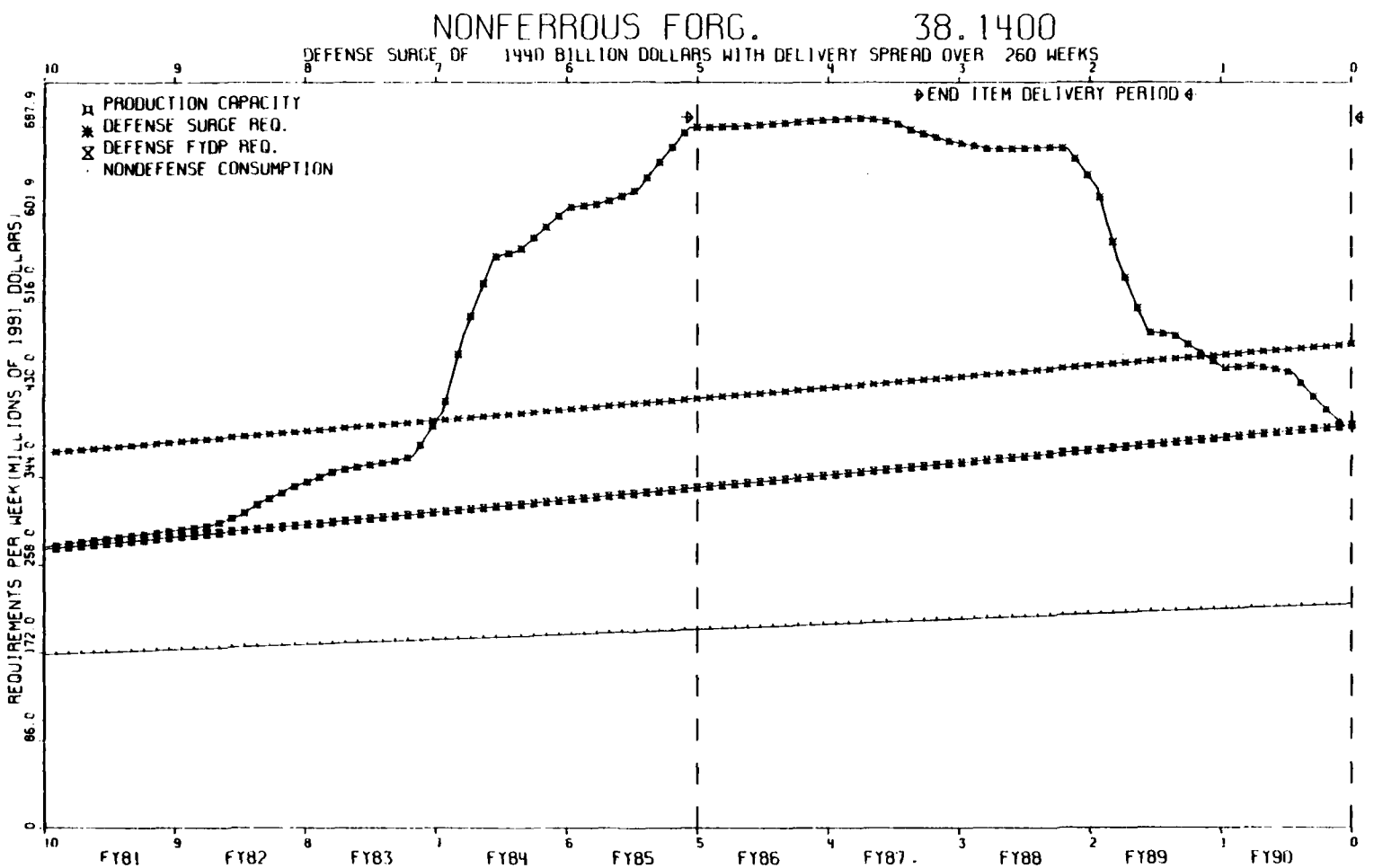

NONFERROUS CAST. 38.1300
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

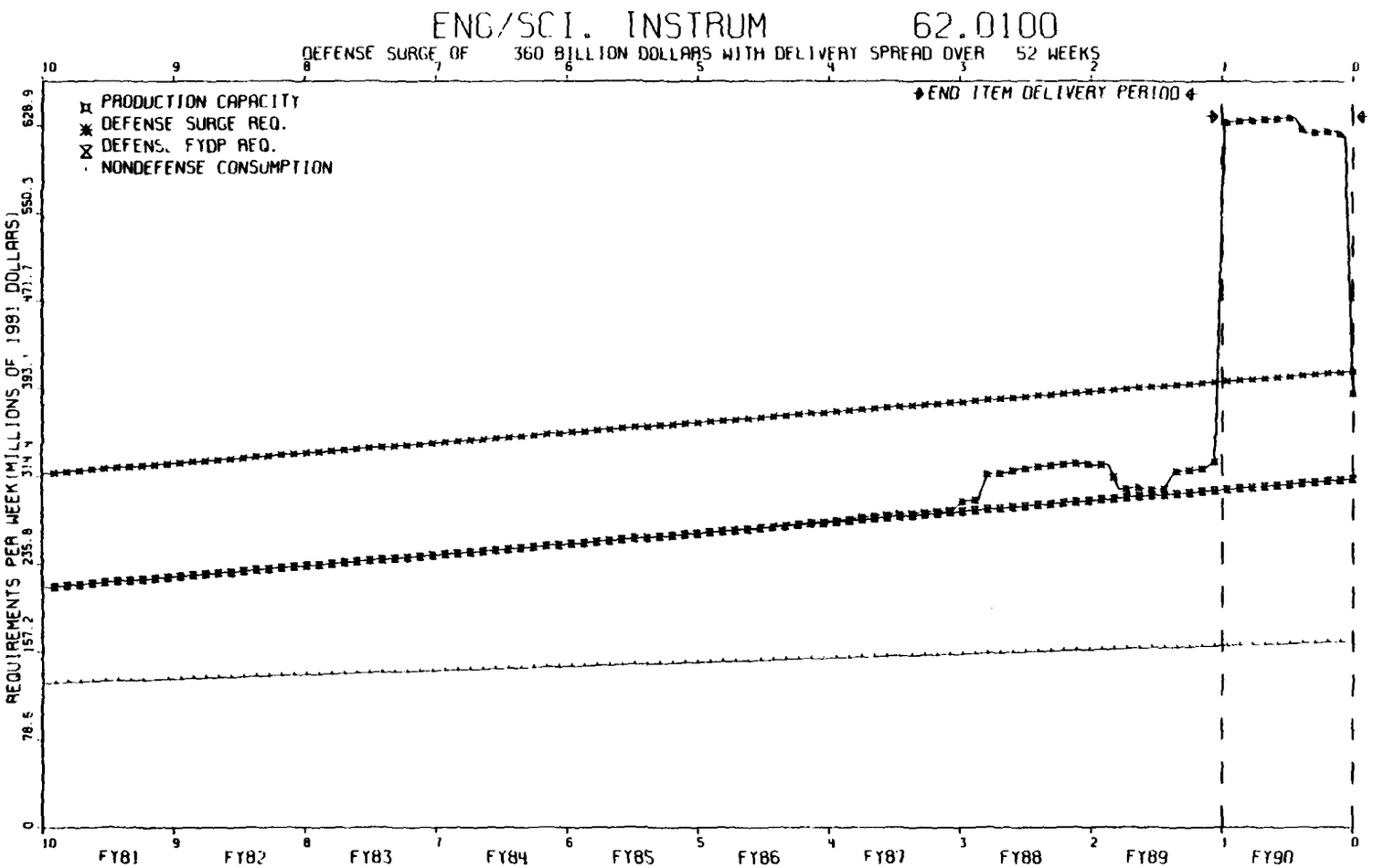

PRODUCTION CAPACITY
DEFENSE SUPPLY
DEFENSE DEMAND
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD

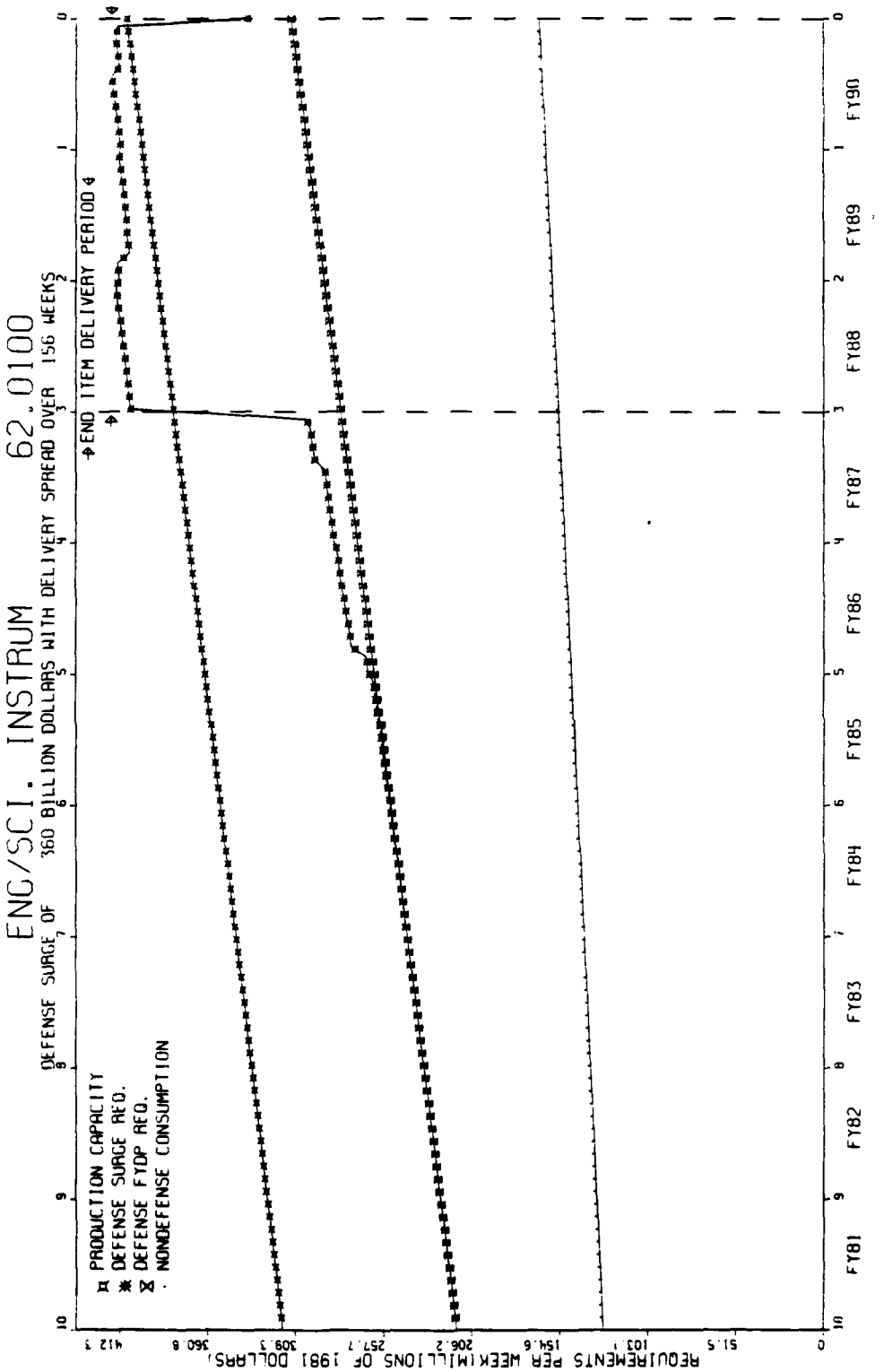

NONFERROUS FORG. 38.1400
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
623.9
545.9
467.9
389.9
311.9
234.0
156.0
78.0
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

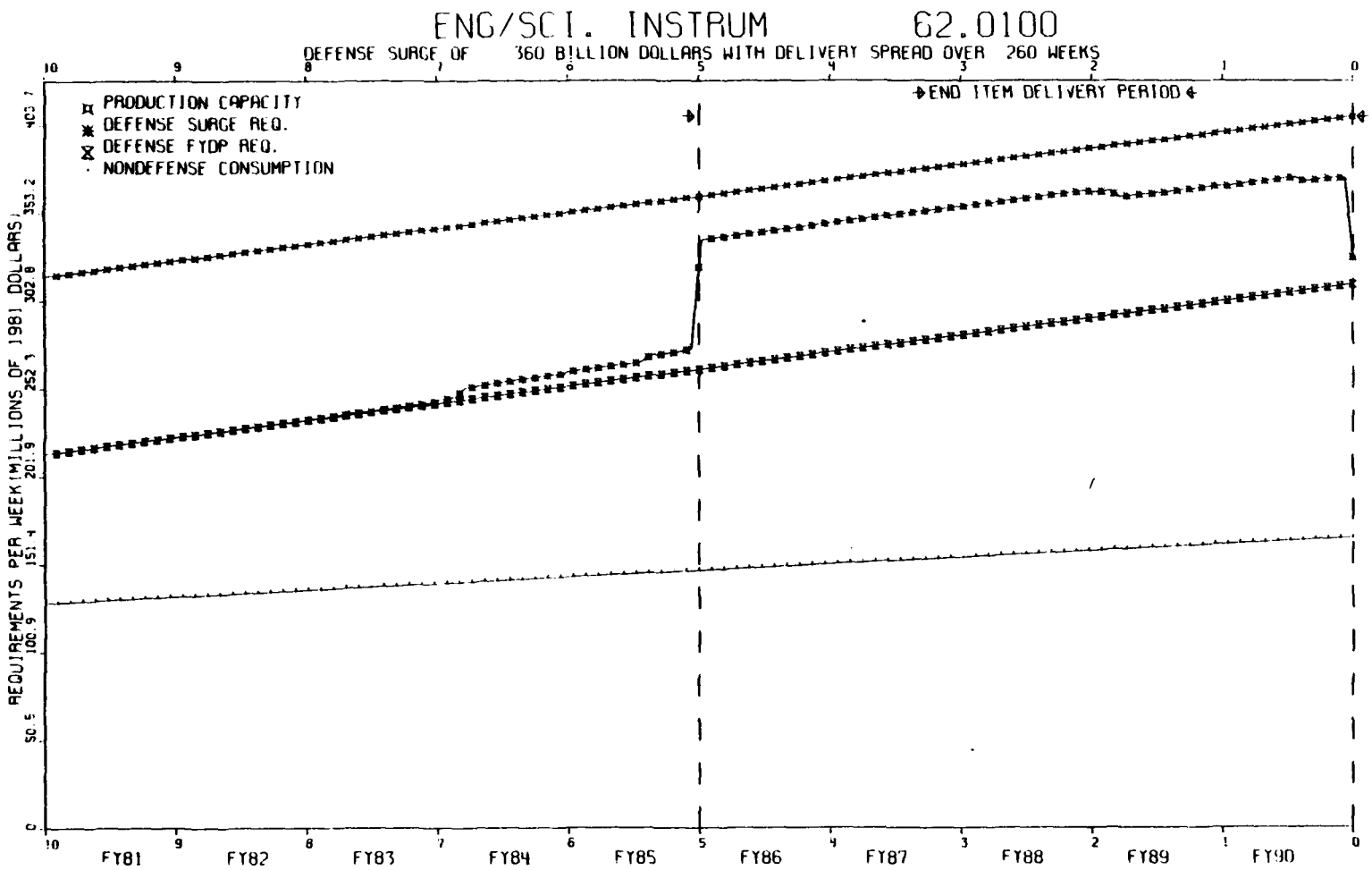

NONFERROUS FORC. 38.1400
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1982 DOLLARS)
0
60.8
121.5
182.4
243.2
304.0
364.9
425.6
486.4
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

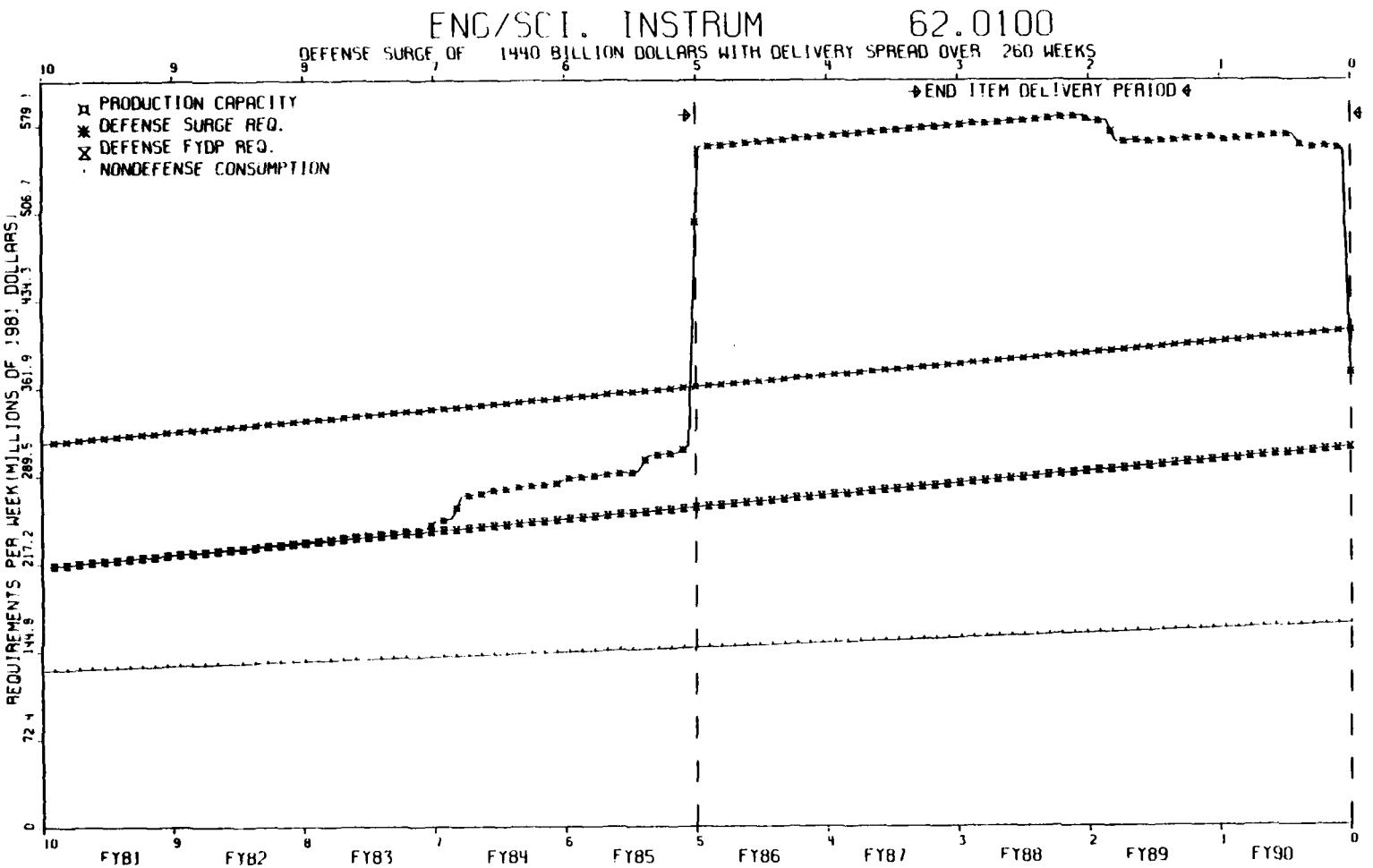

NONFERROUS FORG. 38.1400
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
468.5
410.0
351.5
292.9
234.3
175.7
117.2
58.5
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90

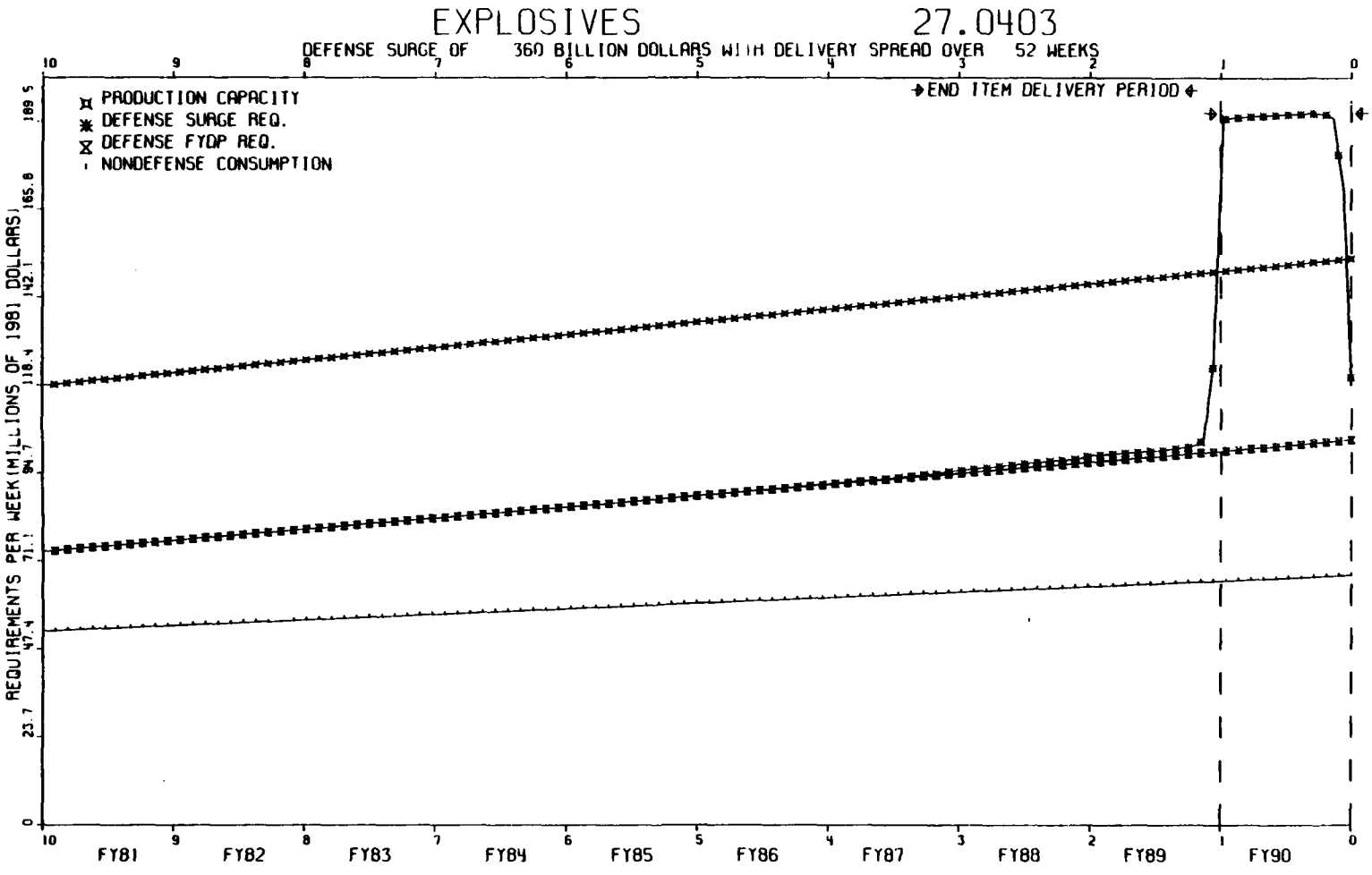

NONFERROUS FORG. 38.1400
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
0
86.0
172.0
258.0
344.0
430.0
516.0
601.9
687.9
10
9
8
7
6
5
4
3
2
1
0
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

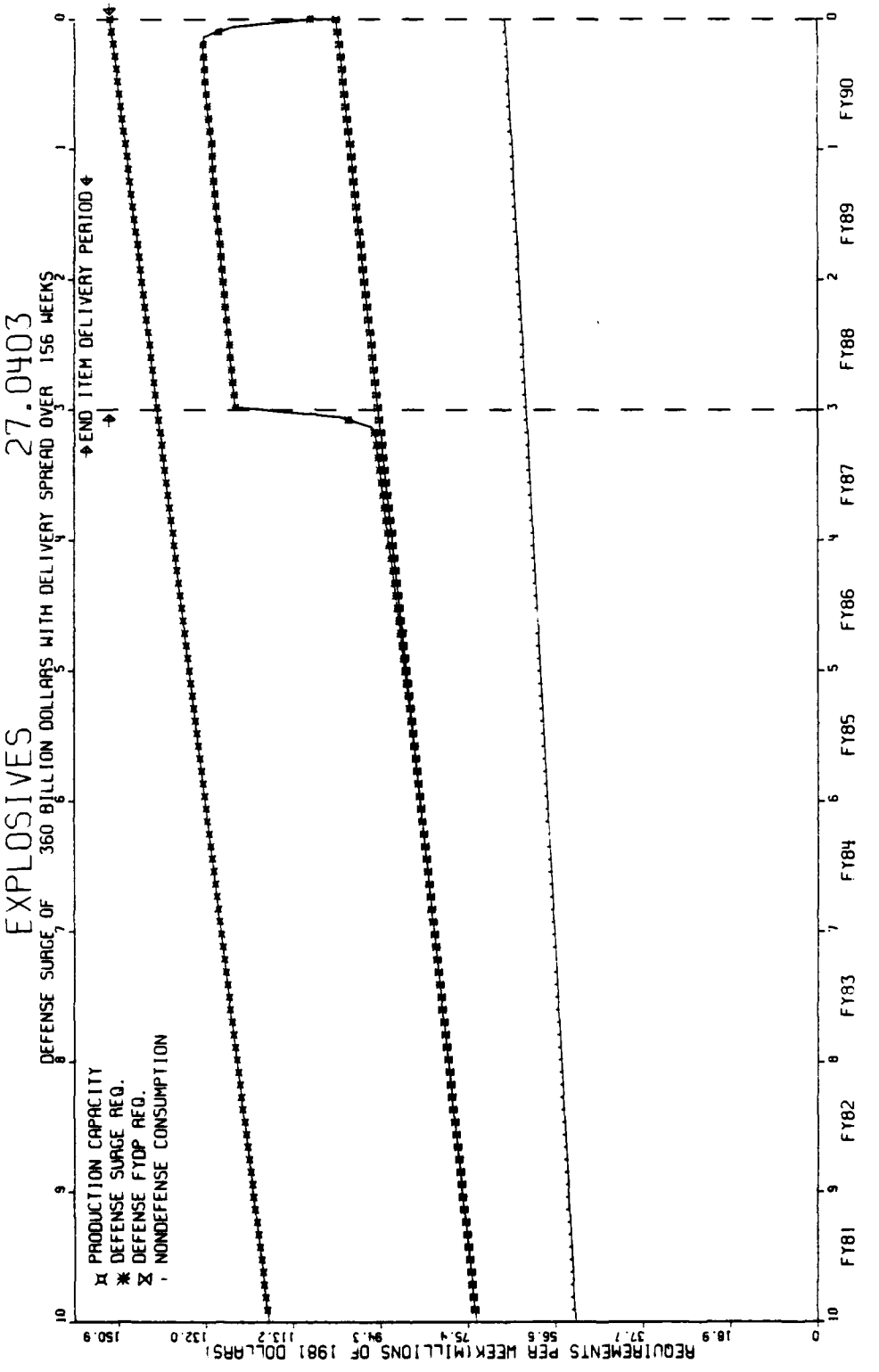

ENG/SCI. INSTRUM 62.0100
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENS. FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
628.9
550.3
471.7
393.1
314.4
235.8
157.2
78.6
0
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90


ENG/SCI. INSTRUM 62.0100
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK(MILLIONS OF 1981 DOLLARS)
0
51.5
103.1
154.6
206.2
257.7
309.3
360.8
412.3
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90


ENG/SCI. INSTRUM 62.0100
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK(MILLIONS OF 1981 DOLLARS)
0
50.5
100.9
151.4
201.9
252.3
302.8
353.2
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90


ENG/SCI. INSTRUM 62.0100
DEFENSE SURGE OF 1440 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK(MILLIONS OF 1981 DOLLARS)
0
72.4
144.8
217.2
289.5
361.9
434.3
506.7
579.1
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90


EXPLOSIVES 27.0403
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 52 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK(MILLIONS OF 1981 DOLLARS)
0
23.7
47.4
71.1
94.7
118.4
142.1
165.8
189.5
10 9 8 7 6 5 4 3 2 1 0
FY81 FY82 FY83 FY84 FY85 FY86 FY87 FY88 FY89 FY90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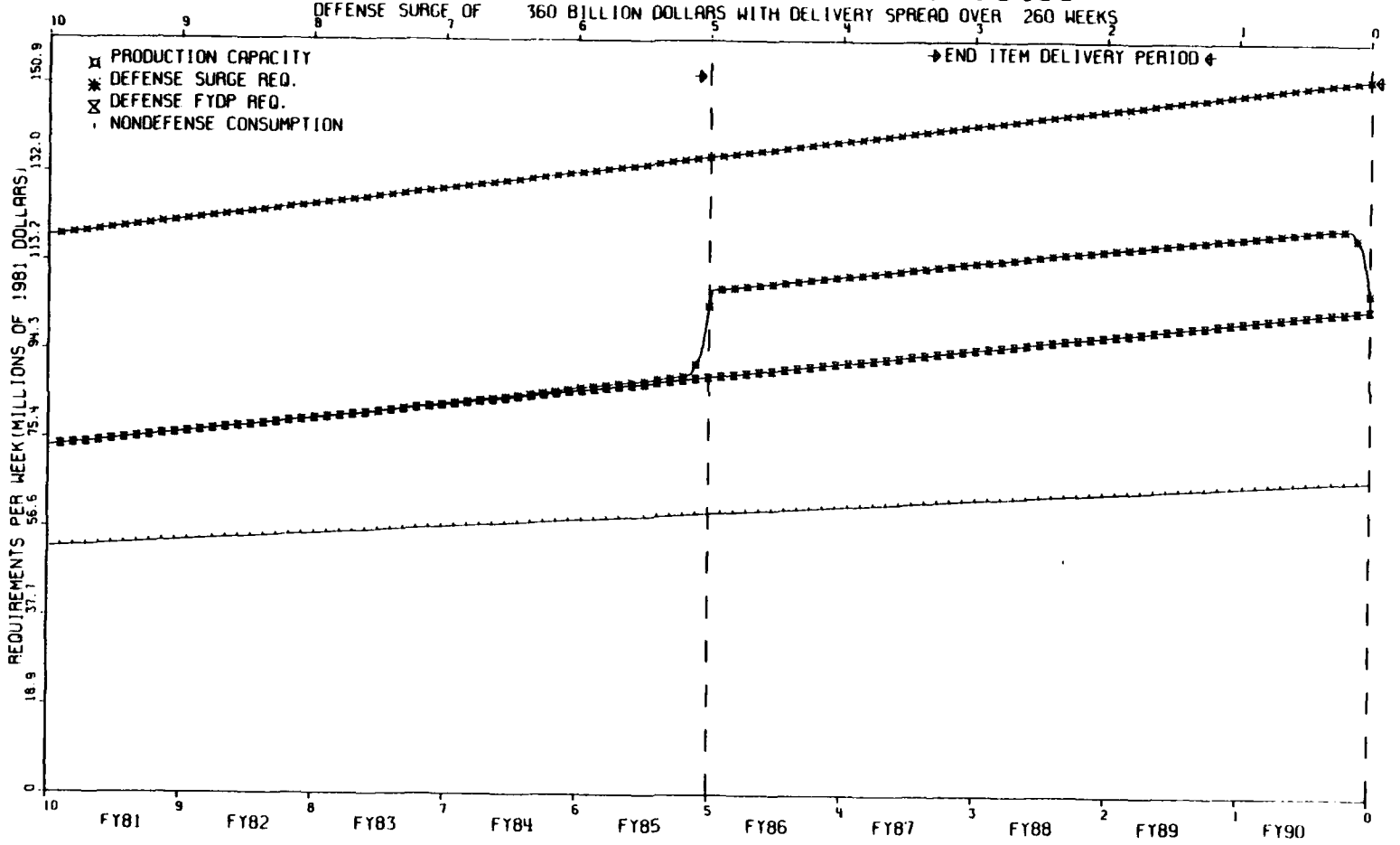
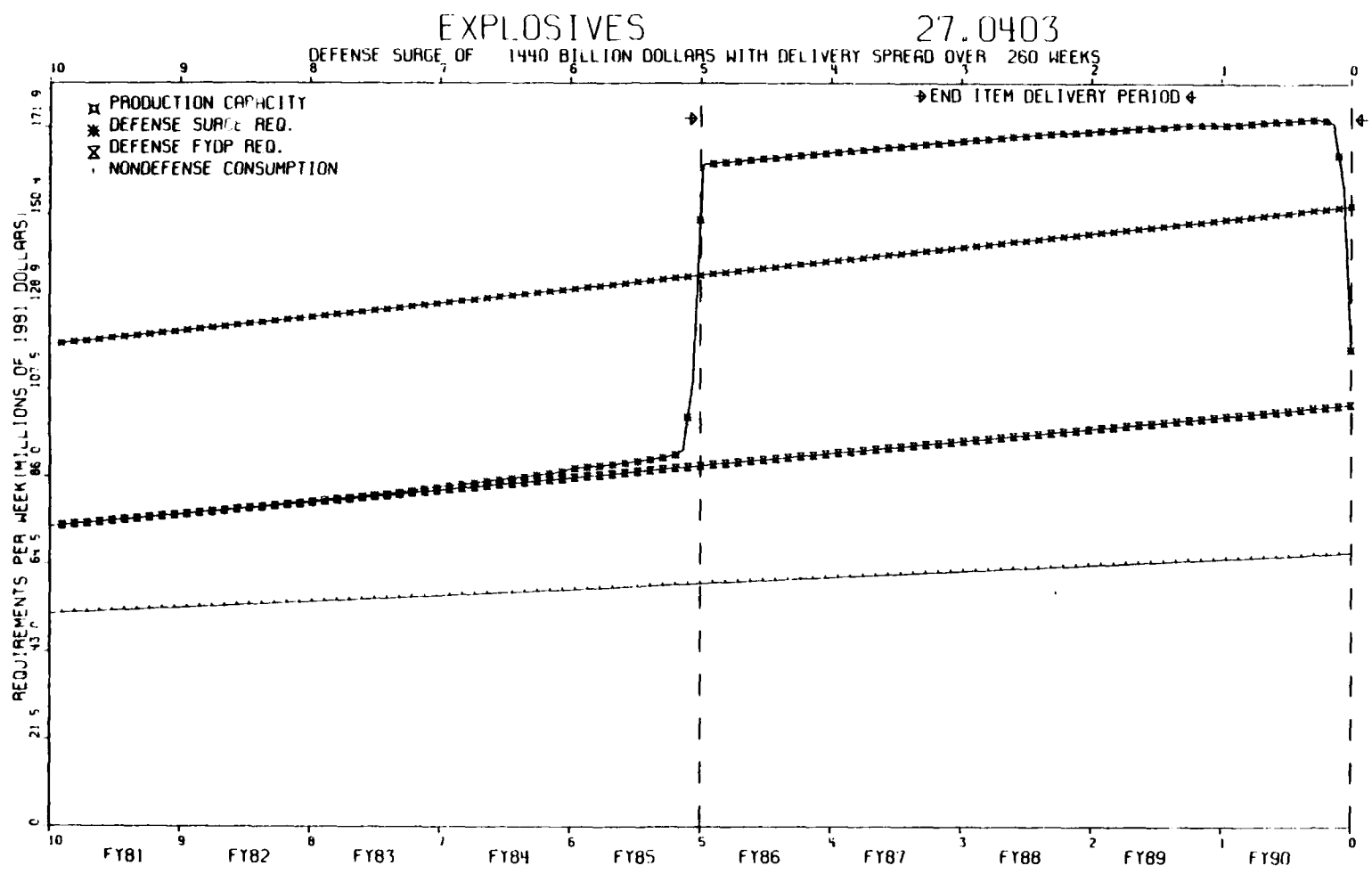
DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 156 WEEKS
END ITEM DELIVERY PERIOD
PRODUCTION CAPACITY
DEFENSE SURGE REQ.
DEFENSE FYDP REQ.
NONDEFENSE CONSUMPTION
REQUIREMENTS PER WEEK(MILLIONS OF 1981 DOLLARS)
0
18.9
37.7
56.5
75.4
94.3
113.2
132.0
150.9
FY81
FY82
FY83
FY84
FY85
FY86
FY87
FY88
FY89
FY90

EXPLOSIVES 27.0403

DEFENSE SURGE OF 360 BILLION DOLLARS WITH DELIVERY SPREAD OVER 260 WEEKS

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END ITEM DELIVERY PERIOD
REQUIREMENTS PER WEEK (MILLIONS OF 1981 DOLLARS)
FY81
FY82
FY83
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FY85
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FY87
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FY89
FY90

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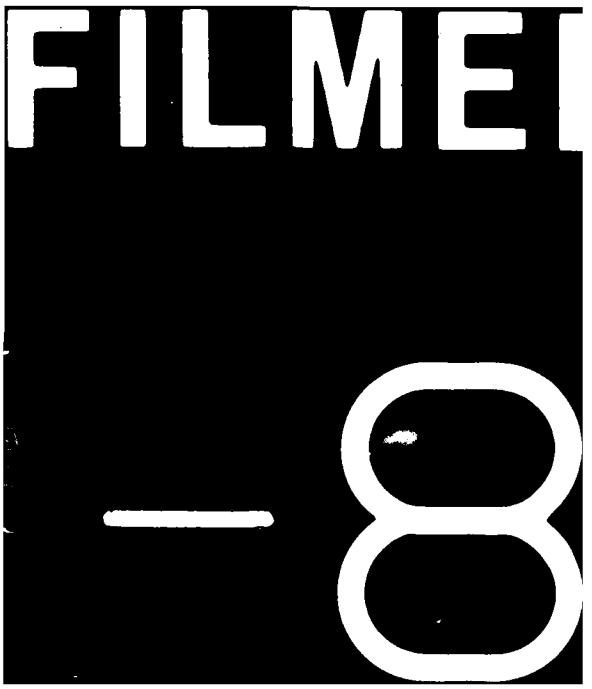
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8